ROADS AND STREETS

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On Oct. 10 Ohio State Paving Record Was Broken by Laying 1,539½ Ft. of 20-Ft. Concrete Road in 16 Hours

"Thinking Ahead" Helps Complete Big Ohio Road Job Quickly

ANOTHER link in the high speed highway between Columbus and Marietta, Ohio, will be finished this year with the completion of the link extending south from McConnellsville toward Beverly. It is estimated the road will be opened 3 weeks ahead of specified time, an accomplishment achieved through the efficiency, advance engineering, job set-up and production schedule of Ray Strawser, Inc., contractors.

This section is part of State Route 37, in Morgan County, and extends for 9.13 miles. It is known as Federal Aid Project 480E. The contract called for grading, including much relocation, paving, culverts and bridges. The contract was awarded to Ray Strawser, Inc., Columbus, Ohio, on April 15th, for $253,859.47.

Topography.—To understand the conditions on this job, a knowledge of the topography in southeastern Ohio is essential. This section is exceptionally hilly, forming the foothills of the mountains of West Virginia which are found just across the river from Marietta, Ohio. This particular section was exceptionally undulating, and transportation was slow and hazardous over the old narrow brick road of steep grades and sharp curves.

New Location and Grades.—On the new road the location was changed to achieve two results (1) elimination of sharp curves and, more importantly, (2) the elimination of many grades and reduction of those essential.

To accomplish this latter the grade line was established so as to make the job throughout a balanced job of opposed cuts and fills. Only about 8000 cu. yd. of borrow were required for the fills, and all cuts were so located that, with a very short haul, all excavated materials could be used in nearby fills. When it is considered that the entire job involved moving about 400,000 cu. yd. of excavation, the excellent engineering in establishing this gradient is apparent. This was also a factor in the speed of completing the job as the shovels had

Cuts and Fills Were Balanced Throughout. This Shows the Usual Close Proximity of Cuts and Fills

little light grading to contend with, and were practically always in cuts, working against banks high enough to enable them to produce big yardage.

Grading.—The job was worked in two sections, one of 5 miles starting at McConnellsville, and a 4-mile section at the far end of the job.

Starting out of McConnellsville, a huge cut had to be made. The first operation, however, was started by moving in two 1½-yd. Lorain-75's to a point up beyond this cut and working them away from McConnellsville. These two units were "leap-frogged" past each other from cut to cut, to the far end of the 5-mile section. One of these units started operations on May 9, and the second on May 10. They were augmented by an Erie gas and air shovel which was moved in later from Cambridge and which took care of the lower cut near McConnellsville.

On completion of the first section, paving operations were started, working out from McConnellsville, and the shovels moved onto the second section, one Lorain working from the McConnellsville end and the other Lorain and the Erie working in from the far end of the job. The same leap-frogging operations were continued, working the many balanced cuts and fills.

Equipment used on the grading operations, in addition to the shovels, consisted of 12 3-ton International trucks, and 4 Caterpillar 60's and 3 Caterpillar 50's with 7½-yd. Athey crawler wagons, hauling from underneath the shovels. Three bulldozers and three rollers were used in building the many fills, aided by two 12-ft. Galion graders.

Yardage Record.—The manner in which the job was set up, and pushed, is well indicated by the following

One of the 1½-Yd. Lorain 75's Used on the Job, Showing the Character of Some of the Excavating.

shovel record for 2 shovels, each working two 7-hour shifts daily.

Lorain-75 No. 1	Cu. Yd.	*Lorain-75 No. 2*	Cu. Yd.
May 9 to June 15.....	54,057	May 10 to Aug. 1.....	88,380
June 15 to July 15.....	35,814	Aug. 1 to Sept. 5.....	35,795
July 15 to Sept. 1.....	37,969		
Total	127,840	Total	124,175

Paving.—The paving specifications called for a 20-ft.

A 50-Ft. Concrete Bridge, Weighing 350 Tons, Was Raised 9 Ft. to Meet the New Grade.

reinforced concrete highway, of 9-in., 7-in., 9-in. pavement of standard Ohio state specifications.

Materials—Sand and gravel were supplied by the Muskingham Sand & Gravel Co. who shipped materials down the river to Malta, O., to a property owned by Ray Strawser. Here a stiffleg derrick unloaded the barges into stock piles.

Cement came from the Fultonham plant of the Columbia Cement Co., being delivered in covered barges at Malta.

At Malta the batching plant was set up, consisting of two Heltzel bins, one fed by a General crane with ½-yd. bucket, the other by a 1035 Erie with ¾-yd. bucket. One bin, of 2 compartments, was used to handle the 2 sizes of stone required. The other bin, of 1 compartment, loaded the sand.

Malta is located just across the river from McConnellsville and all batches were hauled from here, which meant a maximum haul to the far end of the job of

Cement Was Delivered in Covered Barges. Sand and Gravel Came from Zanesville, 28 Miles Away.

The First Cut Out of McConnellsville, Showing the Drainage Ditch of Brick Reclaimed from Old Road.

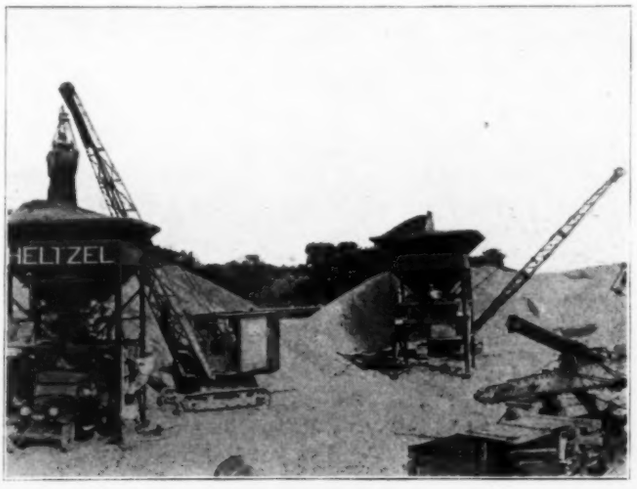
about 9½ miles, or an average haul on the job of about 5 miles. Thirty-five 2-batch trucks were utilized to haul the materials to the paver.

Paving Record.—A 27E Multi-Foote paver was used to pour the concrete and a good idea of the entire paving set-up can be obtained from the paving production established on Oct. 10.

On this day, working on the far end of the job, with a 7-mile average haul, pumping water 21,000 ft. from Meigs Creek, with one Jaeger pump, 1,519½ ft. of 20-ft. pavement was poured in 16 hours. Due to a 190-ft. curve on this section, calling for two additional feet of width, this was equal to pouring 1,539½ ft., thereby establishing a new record for the state of Ohio.

Bridges.—The job did not call for any new bridges as the new line was placed to utilize rather new existing bridges. The grade change, however, called for one rather unusual job in raising an existing bridge 9 ft. to meet the new grade.

This bridge was a 50-ft. span, concrete bridge of 23-ft. 6-in. roadway, weighing 350 tons. Four 100-ton



The Batching Plant.

jacks of 12 screws each were used to raise the four corners of the bridge simultaneously. As it was raised steel sections were bolted in place at the corners of the original abutments and extended upward as the bridge was raised the full 9 ft. Then the steel corner columns were framed and formed into a concrete abutment. To meet the new grade two new concrete slab approaches of 20-ft. span had to be built.

This job was an experiment for the Ohio State Highway Department and their success with it opens new possibilities for economies by using existing bridges on new locations.

Wider approaches and new wearing surface was also applied to a 43-ft. span concrete bridge over McConnel's Run. Federal Aid did not participate on the bridge work.

Drainage and Culverts.—Because of the nature of the job and its many fills, many culverts were required. A

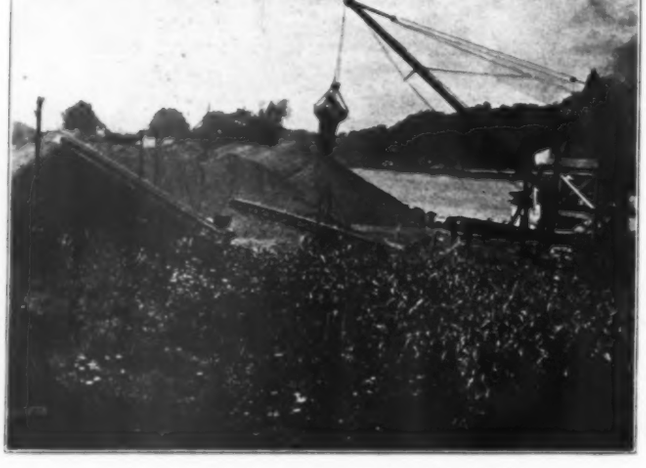
Caterpillar Fifty and Athey Wagon Hauling from Lorain 75

total of 30 culverts were placed of 30-in. and 36-in. concrete pipe.

In addition two box culverts were built on the big cut coming out of McConnellsville, one to carry the drainage of this natural watershed under the road at the top of the cut, and another to cross over at the lower end of the cut and to discharge into the creek.

An unusual feature of the job was the brick-lined ditch which ran down the hillside, connecting these two box culverts.

This was about 2,100 ft. long and is shown in the accompanying illustration. It was 22 ft. wide and was



Unloading Barges and Building Stock Pile.

built of brick, reclaimed from the abandoned road, grouted with concrete into a lasting structure.

Safety Features.—Although the specifications called for the maintenance of local traffic only, the contractor went beyond the usual requirements of safety signs and notices and had some of his own made which were posted at all necessary points of the job, particularly wherever men were working.

So thoroughly was this phase of the work covered that when the job was inspected by the State Industrial Commission, James Wittenbrook who was responsible for this operation, was highly commended for the thoroughness of safety notices and safeguards, and adherence to regulations.

Personnel.—This job was one of three large road jobs handled during 1932 by Ray Strawser, Inc., Columbus, O., of which Ray Strawser is president and Chas. F. Eyler, secretary and treasurer. H. A. Baker was superintendent in charge of all field operations, assisted by Grading Foremen Whittie and Covey, in charge of the two Lorain-75's. This work was done on Division No. 10 of the Ohio State Highway Department, in charge of A. W. Sherwood, Division Engineer at Marietta, O.

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Gas Tax Diversion Nullifies Federal Job-Giving Program

By E. E. Duffy

ALTHOUGH the Federal Government is engaged in a nation-wide job-giving program, many states are nullifying the value of this work by creating new thousands of jobless.

This is being done through diversion of road money collected from motorists. Instead of building highways with this money, as was intended when motor taxes were created, it is being used for state and county institutions, unemployment relief and countless other purposes.

The effect of this diversion is to throw thousands of men out of road jobs, thereby increasing the lists of those who need direct help. Road employment figures reveal that when road money is diverted to even such a worthy cause as direct unemployment relief, the good obtained is more than offset by the increased dole lists and the enlarged burden on the public.

The chief objective of the Federal relief program is to create jobs and to increase the numbers of self-supported individuals and families. It was not anticipated that states would nullify the program by stopping road building through diversion, an act which violently opposes the spirit of Federal help.

Diversion appears particularly illogical when it is considered that no industry exceeds road building in the distribution of money to labor. According to the U. S. Bureau of Public Roads, 90 per cent of every dollar spent for roads goes to labor through many outlets. For example, Frank T. Sheets, Chief Highway Engineer of Illinois, recently announced that the $60,000,000 road construction program planned for that state during the remainder of 1932 and in 1933 will mean that labor will receive $54,000,000 in one way or another—jobs for 77,500 men for 200 days, sustenance for 310,000 people.

Another reason why road money should be spent for roads only, is the fact that states receiving Federal money for direct relief must repay the loans from future Federal Aid road allotments. Consequently states borrowing now, will receive less Federal Aid money in the future and will accordingly scale down road building.

It is further pointed out that highway building is one of the few industries in which men can be kept at work producing facilities which can be immediately used by the public with profit without flooding a market and without the necessity of selling the thing produced before it becomes usable.

THINK—

Mr. Taxpayer!
Mr. Business Man!
Mr. Public!

Read the Facts

Truck Tax Should Be Based on Scientific Investigation

By WALTER A. OLEN
President and General Manager The Four Wheel Drive Auto Co.

The question of taxing and regulating trucks should be considered from the standpoint of the economic value of the truck to society. The truck should pay a fair tax for the use of the highways, but this tax should be based on scientific investigation as to the wear caused by the operation of the truck and not to meet the demands of an organized minority whose aim is to tax and regulate the truck off the highway. Tests already conducted by our Federal Government show the amount of wear caused by various sized trucks on highways and an adequate compensation necessary for each size truck to maintain these highways, has been established.

Truck regulation and taxes based on facts will be in the best interest of all concerned. Why should the American people be penalized if the truck is found to be fundamentally more economical for short hauls? Taxing these short hauls at the expense of the public to bring this business back to the railroads is not sound economics. There is a definite field for the truck and a definite field for the railroad. There is a profitable range of operation for the motor truck and a profitable range of operation for the railroad. The railroads cannot hope to compete with the more profitable range of the motor truck with their present equipment and methods, except by shackling the truck with unnecessary red tape and regulations and forcing the public to pay the penalty of the railroads' increased cost of short haul transportation.

Not all truckers are angels and not all railroads are lobbying against the best interests of the people. There is the fly-by-night trucker, who operates to get the business regardless of profits, who will eliminate himself just as the uncompromising railroads, who think they have divine priority rights, regardless of the economic loss of their shortcomings. The legitimate trucker is the man to be protected in the interest of the public good, just as the more progressive railroads, who see the handwriting on the wall, and are making use of this new tool, the motor truck, to better serve their patrons. The progressive railroads are selling transportation, not

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freight in box cars, and the motor truck is part of this service. They, like the progressive trucker, are interested in a square deal for the motor truck.

Uniform size and weight restrictions and taxes for trucks, based upon recognized non-partisan investigation as to the wear caused by various sized trucks, will solve this truck and rail controversy and will leave a profitable field for both the motor truck and the railroads.

A SYMPOSIUM ON TRUCK REGULATION

The Problem Should Be Considered on the Basis of Facts

By T. R. DAHL
Vice President, The White Company

Regulation and taxation of motor trucks is one of the important economic problems before the country, directly affecting the cost of produce purchased by every person. Legislators convening this year should disabuse their minds of unsupported and prejudiced representations and consider the problem on the basis of facts, if business is to profit from the many economies and conveniences available through highway transportation.

I see no necessity for comparing railroad transport and highway transport as a basis for regulation and taxation, for in my opinion they are essentially different. Highway transport fully appreciates the importance and necessity of rail transportation, and its interest in the continuance of rail facilities is evidenced by the fact that in 1930 highway transport was one of the railroads' largest customers, using 3,090,000 freight cars and paying for that service approximately one-half billion dollars.

Many ridiculous statements are made in reference to motor truck traffic, and many unwarranted cartoons appear in our daily papers depicting the motor truck out of all proportion to actual facts. Let us look at a few of the important facts of highway transport.

Eighty-five and eight-tenths per cent (85.8 per cent) of the motor trucks in this country, constituting 12½ per cent of the motor vehicles, are privately owned and privately operated. This great majority of trucks—86 out of every 100—are doing the individual's private business. They are not common carriers; they do not solicit the transportation of merchandise; they have the same rights on the public highway as the private passenger car; they are subject to regulation in every state under the police powers of the state under which passenger cars are also regulated. They can not be regulated as to their business as distinguished from their physical characteristics. Thus, six-sevenths of the trucks on our highways today, privately owned and privately operated, having the same rights as passenger cars that cannot be regulated as to their business, are doing a horse and wagon job. There must be a full understanding of this undisputable fact if we are to understand highway transport and to intelligently consider its regulation, taxation and use of the public highways.

Motor trucks and motor truck transportation have been much maligned and misrepresented in the matter of paying taxes for the use of the highway for its road bed. The accusation that motor truck transportation is subsidized by the furnishing of a free road bed has attracted much attention in the public prints. As far as the claims of free highways is concerned it is sufficient to state that motor trucks and buses alone paid $250,000,000 in taxes for the use of such highways in 1929. Common carrier trucks paid 14 times the taxes paid by private passenger cars, and busses paid 23.6 times such taxes. No less an authority than Thos. H. MacDonald, Chief of the Bureau of Public Roads of the U. S. Department of Agriculture, says that after an extended examination of motor truck taxes and railroad charges for maintenance of way and structures "the commercial motor vehicle not only pays a very considerable sum for its use of the highways, but also on the average it actually pays much more per ton of capacity than a typical well-kept railway sets aside from its earnings for the maintenance of its tracks and structures." Motor truck operators pay more taxes per ton hauled than do the rail carriers. Motor truck equipment pays a bigger percentage of taxes per dollar assessed valuation than any other property subject to taxation in the United States.

Discriminatory legislative practices can be carried to a point that will make truck transport unprofitable,

T. R. Dahl

throw millions of men out of work, disrupt the distribution system of the country and force the scrapping of equipment in which millions of dollars are invested.

Before legislators follow the herd, led by paid lobbyists, to straddle further regulation and taxation on highway transportation they should study these facts:

1. Motor vehicles pay $1,025,735,112 or 10 per cent of all taxes.
2. Motor trucks only, constituting but 13 per cent of all vehicles, pay 27 per cent of the special taxes paid by motor vehicles, amounting to more than $293,000,000.
3. Eighty-five per cent of all trucks are privately owned and operated—hence cannot be subjected to business regulation.
4. But 1½ per cent of all trucks are engaged in common carrier interstate operations.
5. Trucks are serving more than 45,000 communities which now are without rail service of any kind.
6. The 3,490,000 trucks are owned by 2,500,000 individuals. Of these 2,200,000 own but one truck each.

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Eighty-five per cent of all rail operation is controlled by 15 systems.

7. Special motor tax share of state and local road income increased from 10.8 per cent in 1921 to 46.5 per cent in 1930.

8. Automotive industry despite railroads' attitude toward highway transportation is the railroads' largest customer, using 3,090,000 freight cars in 1931 at an expenditure of approximately one-half billion of dollars.

9. ***Motor trucks alone in Ohio (which is indicative of all other states) pay more taxes in license fees and gasoline taxes than all the railroads in the State pay in all types of taxes.***

10. It takes a minimum of 1,000 men to transport the same number of tons of freight by motor truck that can be carried by one freight train with a crew of but five men.

11. During the past 4½ years the number of commercial vehicles involved in accident fatalities decreased 31 per cent while during the same period passenger cars involved in fatalities increased 59 per cent, disproving the *statement that trucks are dangerous on the highways.*

12. Truck regulation will benefit the rails only if the cost is materially increased to the shipping public.

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Is Efficiency in Transportation at Fault?

By J. M. CLEARY
President S. P. A. Truck Corporation

Have motor trucks served the American public too well? Is engineering genius as expressed in design, is economy in manufacture and is enterprise in operation to be penalized?

J. M. Cleary

A flood of restrictive legislation, framed to hamper motor trucks and to burden them with oppressive taxation, seems to indicate that efficiency in transportation is considered by some to be a fault.

Manufacturers have been exerting themselves to the utmost to produce and sell trucks for lower and lower prices, to make them more and more thrifty in operation. And they are now confronted with legislation that deliberately sets out to increase selling prices and operating costs.

The present depression was caused by a break-down in our machinery for the exchange of merchandise. With a superabundance of every imaginable raw material and every manufactured product the flow of commerce, the interchange of commodities became blocked and, as a result, millions are in want. Surely this is not the time to place artificial handicaps on one of the most important, one of the most efficient, one of the most economical factors in the production, manufacture and distribution of every form of merchandising.

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Motor Vehicles Pay 10% of All Taxes

By M. L. PULCHER
President Federal Motor Truck Co.

In spite of overwhelming evidence to the contrary, the accusation is repeatedly made by certain powerful propagandists, that motor vehicles do not pay their way on the nation's highways. Perhaps this has been so often repeated that said propagandists believe it themselves. But it is nevertheless far from the truth.

As a matter of fact, motor vehicles pay a greater percentage of taxes per dollar of assessed valuation than any other property subject to taxation in the United States. And that is supported by facts and figures that are not open to question.

Let us consider, for instance, the tax figures for the state of Michigan, as submitted in a recent bulletin issued by the Michigan Manufacturers' Association:

General tax in Michigan for 1931 totals..$18,504,285.28
General tax plus corporation tax and other sources of revenue makes a total of 35,723,724.74

This bulletin shows that $6,021,764.48 of general taxes are delinquent.

It shows also the startling fact that there have been collected in the form of gasoline taxes, vehicle weight tax, certificate title fees, duplicate license plate fees, and similar items, $45,256,178.62.

That's the contribution of the automotive industry in just one state, *and that has been collected*—cash on the barrel-head. There is no $6,021,764.43 carried on the books. Then add to this tremendous sum the millions of corporation tax and other assessments paid by the automotive industry.

This is typical of motor vehicle taxation in other states. As a matter of fact, the motor vehicle pays 140.7 per cent of its average value in taxes during its normal life of seven years. It not only pays a tremendous price for the use of the nation's highways, but

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actually pays 10 per cent of all taxes. Of the grand total of $10,250,000,000 federal, state and local taxes, motor vehicles pay $1,025,735,112.

And the motor truck, representing only 12 per cent of the motor vehicles in the country, pays 28 per cent of the total motor vehicle tax. Practically all for-hire trucks pay taxes equal to at least 6 per cent of their gross receipts. No truck can operate without paying a minimum of $50.00 per year—and from that up to $2,000.

In the October issue of *Nation's Business,* J. H. Pew, president of the Sun Oil Company, calls attention to the

M. L. Pulcher

fact that state gasoline taxes alone in 1931 were $536,000,000. Adding property, corporate, production, income, license and other levies, brings a total of $709,000,000. Add to this the new Federal taxes, which will produce $160,000,000 on gasoline, $33,000,000 on lubricants and $7,000,000 on pipe line transportation, and there is a grand total of $909,000,000 for the current fiscal year. These are staggering figures. And bear in mind that this is all charged right back to owners of motor vehicles, by whom this enormous tax must eventually be paid.

Toll roads are supposed to be a thing of the past in this country. But let's see what progress has been made in this direction. Under the old toll system, a 3-ton truck would probably pay not to exceed 1 ct. per mile to travel from Detroit to Pontiac, Michigan, a distance of 25 miles. Today, a 3-ton truck in many states must pay a toll of approximately 5 ct. per mile for the use of the highways. Therefore, for one round-trip equal to the distance from Detroit to Pontiac, the truck owner with a 3-ton truck must pay $2.50. And that's a very sizeable toll!

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EIGHT TO ONE.—The new state highway commission of Oregon has announced abandonment of the policy of constructing roads by hand labor as a means of providing relief for unemployment. It was estimated that for the cost of one mile of road built by hand labor, eight miles could have been built by contract with the use of machinery.—*The Earth Mover.*

Motor Trucks are Paying Their Way

By E. M. STERNBERG
President Sterling Motor Truck Co.

In President-Elect Roosevelt's program of six points for aiding railroads he went decidedly on record in his speech in Utah in opposition to the competition of railroads by carriers using the highways built by taxes and bond issues in which the bus and truck lines have made no investment. The third paragraph of his program is as follows:

"No. 3. Regulation by the Interstate Commerce Commission of all competing motor carriers so as not to give them *unfair competitive advantages* over the "rails" through using highways built by taxes on bond issues in which the truck and bus lines *have made no investments.*"

This paragraph overlooks entirely the taxes paid by motor carriers for their travel arteries.

The public (who profits from trucks if any one does) in general believes that trucks are not paying their way and should be ruled off of the highways by restricting the size, speed and weight. It is very evident that Mr. Roosevelt shares this belief.

Although the financial condition of the railroads is generally blamed on the truck and bus competition, the great reduction in freight and passenger hauling is the real cause and this is due to the present world-wide economic condition. Also many of their ailments are due to lack of necessity for their operations, and an unnecessary paralleling of their systems and facilities. The public in the end would pay dearly for the elimination of this "so called" competition, and all business would suffer. The railroads' lack of appreciation of the service needs to meet the public wants is a factor contributing to this competition.

An argument frequently presented is that buses and trucks should be permitted to operate only if they furnish their own highways. The railroads forget about the bonuses and the tremendous land grants to them by our government. They also pass lightly over the bankrupting taxes paid by these carriers. A few of these taxes are listed below:

Excise tax on purchase of equipment,
License tax,
Federal gas tax,
State gas tax,
Ton mile tax,
Personal property tax.

It is safe to say that if all of the gas tax collected had been used for road building, as was originally promised, there would be ample funds for building parallel lines for buses and trucks along the most used truck highways. Passenger car speed would be increased and more safety on the highways would result. These are two arguments advanced by railroads to influence the passenger car owner against the truck and bus operator, and to accomplish this improvement some of the automobile gas tax could be rightfully used.

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The railroads are not accustomed to outside competition, and are using every effort to eliminate it. When they started out, the fact that the stage coach and the canal boat methods of transportation were put out of business did not concern them greatly because the railroads were a new step in the advance of transportation. The motor truck now represents another advance, and while progress cannot be stopped, it can be hindered. In the meantime the public will be the loser because all transportation is for the benefit of the public.

Why should the Interstate Commerce Commissions be operated only for the benefit of the railroads? Other types of transportation are here to stay, and therefore all means of transportation should be put under this commission. These would include motor carriers, water carriers and aeroplane lines.

The Federal Government, at the present time, is taxing each truck 1 ct. per gallon for its gas, and 1 ct. per quart for lubricating oil. This money is going to the Federal Treasury, and a large part of it is being reloaned to the railroads to pay their fixed charges and bond issues by means of the Reconstruction Finance Corporation.

It is an accepted fact that the automotive industry is carrying over 25 per cent of the entire excise tax of 1932. No other business is taxed anywhere near to the extent of the motor transportation industry. In the State of California alone, in 1931, the motor transportation industry paid $40,000,000.00 in gasoline road tax, and 47 per cent of this tax was paid by trucks.

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Everybody's Stake in The Truck For-Hire

By A. J. Brosseau

President Mack Trucks, Inc.

An attack upon the truck and the bus in 44 state legislatures with a barrage of size, weight, speed, and other operating restrictions, together with more taxes of every kind and description, will be loosed with the new year.

The passenger car owner, and the rest of the general public, will, however, in the event of a successful attack, help "pay the freight."

Motor truck and bus operation can be classified into three main divisions:

The common carrier,
The contract carrier, and
The private carrier.

Let us define the three classes:

The term "common carrier" by motor vehicle includes any carrier of passengers or property by motor vehicle for compensation in interstate or foreign commerce which undertakes or offers to transport passengers or property for the general public.

The term "contract carrier by motor vehicle" means any carrier by motor vehicle regularly engaged in the business of transporting passengers or property for compensation in interstate or foreign commerce under a contract, agreement, or arrangement, and which does not undertake or offer to transport passengers or property for the general public.

The third class—the private carrier—which constitutes some 85 per cent of the total fleet of 3,600,000 vehicles, is made up of all those vehicles which do not come under the first two classes.

The question of where a particular operation falls within the first two classes has been held by the courts to be always one of a determination of the facts of the operation.

The reason we have more than one class of trucks is because the public wants so many different kinds of service. So we have common carrier truckers and contract truckers, in addition to the great majority of owners who buy and operate trucks as part of their business.

The farmer may not want to haul his milk to the railroad station or the city and hires a neighbor or a trucker to do the job.

A grocery chain finds it can cut the delivered price of its goods by truck delivery from certain key points and contracts with a trucker to do the work.

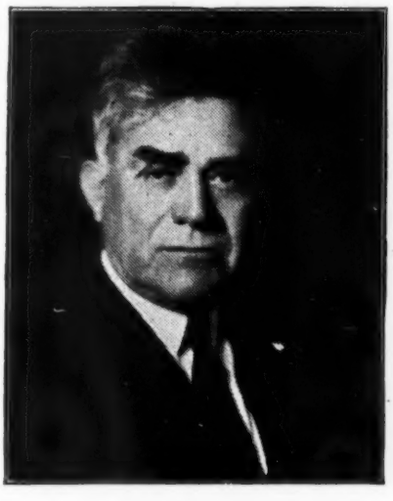
A small manufacturer has shipments going out at irregular intervals to points within a radius of 50 or 100 miles of his factory. An investment in trucks of his own would not be justified, so he relies upon the common carrier truck, or contracts for the service.

Putting all these services in the same kind of regulation strait-jacket would only mean one thing—decreased efficiency and increased cost.

Any kind of regulation beyond that necessary for the protection of life, limb and property, will add to shipping—and consuming—costs. The only question is how far the public interest demands such an extension of governmental supervision.

The Interstate Commerce Commission believes it advisable to make haste slowly.

In its last investigation it referred to the important



A. J. Brosseau.

practical consequences of added regulation and said:

"It is as yet uncertain how far regulation may lawfully be extended to contract carriers which do not operate as common carriers. Yet the common carrier trucks are in competition with the contract trucks, to say nothing of the trucks which are owned by those whose goods they transport. An attempt to regulate common carrier trucks without similar regulation of competing trucks may not only be unfair but may have the result

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of driving the common carriers into the contract field."

Now note the next point the Commission makes:

"It is the common carrier trucks, also, which now largely serve the smaller shipper. Inequality in regulation may, therefore, result in discrimination as between the larger and smaller shippers. . . ."

Just what is proposed by way of more regulation?

Judge Alfred P. Thom, speaking for the Association of Railway Executives in Docket 23,400, recommends the regulation of common carrier buses, trucks and contract carrier trucks, and says further for the Association that they *"do not at this time* recommend that it (business regulation) be applied to owner-operated trucks operated solely in the business of the owner."

Dr. C. S. Duncan, economist, for the same association, in a recent article, in which he attempted to prove that motor vehicles were not paying their fair share of highway costs, added *the entire cost of all city streets and local roads* to the cost of all *main roads,* said:

"In view of the facts that have been presented, it seems obvious to me that no one can claim either that these commercial operations by bus and truck have fully paid or that they are paying now."

The pronouncements certainly are indicative of what will be attempted in the way of punitive regulation and taxation in the 44 legislatures during the early period of 1933.

The argument boils down to two points:

First, are commercial vehicles—both private and for-hire—paying for the roads they use?

Second, does the public interest require additional restrictions upon the business of these operators for hire?

In the first place, highways would be built just as thick and wide if all trucks for-hire were eliminated. The same size vehicles are used by owner-operators.

T. H. MacDonald, Chief of the U. S. Bureau of Public Roads, told the Interstate Commerce Commission last year:

"In my judgment, the heavier trucks and buses by the higher tax which they are paying, and particularly through the collection of gasoline taxes, are fully meeting all excess costs of construction, due to the increased thickness that is made necessary by these heavier loads. . . ."

The same Bureau which Mr. MacDonald heads made study of motor vehicle taxes in Pennsylvania and found that only to a limited extent were the larger vehicles failing to pay their full share of the main road costs. No one should object to all classes of vehicles paying their *fair share.*

Commercial vehicles—buses and trucks—paid $293,000,000 in taxes last year, out of the more than one billion dollars which the tax collectors took from the highway user. They paid better than one-quarter of the total, although they represent only some 12 per cent of all vehicles in use. Truck operators contend that these taxes are a fair share of road costs, and add that their contributions *make available* a marked increase in road mileage to *passenger car owners and other road users.*

In 1930, the last year for which figures are available, the average passenger car paid a tax of $25.52. The average truck paid twice as much; the 3-ton privately operated truck, six and one-third times as much; the common carrier 3-ton truck, 18 times; and the common carrier bus 22½ times as much.

A 3-ton truck in 1930, for example, would have paid an average registration and gas tax of $165 in private operation. The same truck as a common carrier would have paid $459 in taxes.

One other point that is misunderstood is the concentration of traffic on the main roads.

In Michigan, for example, 9 per cent of the roads were found to carry 84 per cent of the traffic. These are the roads over which most of the commercial vehicle mileage takes place and for which these vehicles *should* and *do* pay.

How much more regulation of the trucker is needed?

As to safety—the National Safety Council reports a reduction of 7 per cent in fatalities in which trucks were involved since 1927, while passenger car fatalities were increasing 50 per cent.

The Interstate Commerce Commission said in Docket 23,400: "The motor truck business is carried on for the most part by many persons and in rather small units, and to a considerable extent by the shippers themselves. . . . Because of the far larger number of persons or companies engaged in motor trucking for hire, the motor truck industry tends to be less monopolistic than the motor-bus industry.

The trucking industry is not a monopoly. In a recent study of common carrier operations, the Government found but one operator out of 217 studied who had more than 100 trucks.

Further regulation to "equalize competition" must inevitably increase shipping costs.

The convening of 44 state legislatures and the national Congress with plans already made for the introduction of new legislation to increase taxes and impose new restrictions on truck operators for-hire constitutes a danger signal which the whole highway using public will do well to heed. The operators for-hire are but the "shock troops." If they are wiped out, then the general using public is next in line.

This does not mean that pitched battle is imminent, but the present situation has resulted from an almost abysmal ignorance on the part of other users of the road, of the consuming public, and even of the industry itself, of the public service which this class of vehicles perform.

The vehicle user must get before his legislator and the public generally, the facts as to his present taxes and use of the road. Otherwise, he will be called on to shoulder more trouble, simply because someone capitalizes on a bad state of public psychology.

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Effects of Vehicle Travel on Highways

By PAUL W. SEILEY

President and General Manager, General Motors Truck Corporation

A favorite hobby horse of selfish propagandists against highway transport is destruction of pavements by heavy trucks and buses.

A SYMPOSIUM ON TRUCK REGULATION

In close proximity to our factory in Pontiac we had occasion to make a special survey on the effects of vehicle traffic on concrete pavements on U. S. Highway No. 10 between Detroit and Pontiac. Part of this highway was constructed over 7 years ago and due to right-of-way litigation completion of the work was delayed, leaving a 500-ft. section in this highway unused and therefore not subjected to vehicle traffic of any kind from the time it had been constructed. Yet this particular untraveled section of pavement shows an extremely high percentage of transverse cracks in the concrete slabs, as compared with that part of the highway bearing the heaviest kind of traffic during these 7 years.

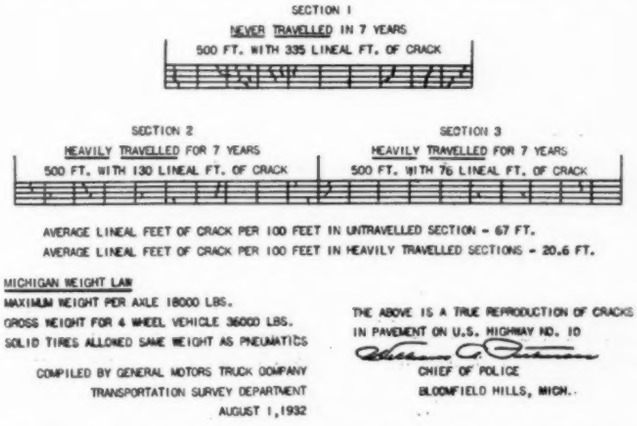
The Michigan law allows 18,000 lb. per axle on either solid or pneumatic tires. Trucks pulling two trailers, weighing up to a total of 99,000 lb. gross, are traveling this highway night and day, transporting heavy tonnage of castings, forgings and other materials to and from manufacturing plants in this highly industrialized area. Regardless of the number and weight of these vehicles, the major portion of this highway is actually in better condition than the 500-ft. section which has never been subjected to vehicle travel of any kind for over 7 years. The lineal feet of pavement cracks in the untraveled section average 67 ft. per 100 ft. of pavement, while a 1,000-ft. section in the same highway heavily traveled for 7 years shows less than 21 ft. of cracks per 100 ft. of pavement.

This untraveled section of 500 ft. also shows that the surface of the concrete pavement has suffered more from the effects of heat and cold than the traveled portion. This is caused by water seeping into the pores of the concrete structure and freezing during the winter, resulting in spalling of the surface, while on the heavily traveled sections, the oil drippings from vehicles have sealed the pores of the concrete and the surface is much smoother than on the 500-ft. section which has never been traveled. The accompanying chart definitely proves that commercial vehicles do not injure a well constructed pavement. The accuracy of this chart was not only checked by local Chief of Police but also by a representative of the Michigan State Highway Commission. It is clearly evident that subsoil and climatic conditions have a far more destructive effect on well constructed pavements than heavy vehicle travel.

Paul W. Seiler

Highway traffic congestion is also being exploited, since opponents to highway transport have appointed themselves as "guardian angels" for the traveling public on the highways. A study of factors contributing to traffic congestion is highly interesting. By reducing sizes and weights of heavy duty trucks and trailers, tonnage which cannot be hauled by any other means of transportation, must necessarily be split into smaller loads and carried on a greater number of lighter vehicles.

According to our Michigan weight limitations of 18,000 lb. per axle and allowing two trailers to be pulled by a motor truck, a 30-ton payload can be hauled on such a combination of vehicles occupying a space of only 60 ft. on the highway. If reductions in weight limitations were put into effect in Michigan similar to those which have been enacted in several southern states, it would result in a greater number of vehicles on the highway in order to move the same payload. Allowing a space of 200 ft. between each vehicle, 10 3-ton trucks would occupy 2,000 ft. on the highway and if we have to use 15 2-ton trucks, the total space required on the highways is 3,100 ft. as compared with the one combination unit only 60 ft. in length carrying the same payload.



From personal observations in traveling over 25,000 miles on the highway this year, I concur with the views of Professor Worley of the Michigan University who recently testified before a legislative committee that his experience on the highway convinced him that it is less hazardous to pass a vehicle combination 60 ft. long than passing two 1921 vintage passenger cars following each other on the highway.

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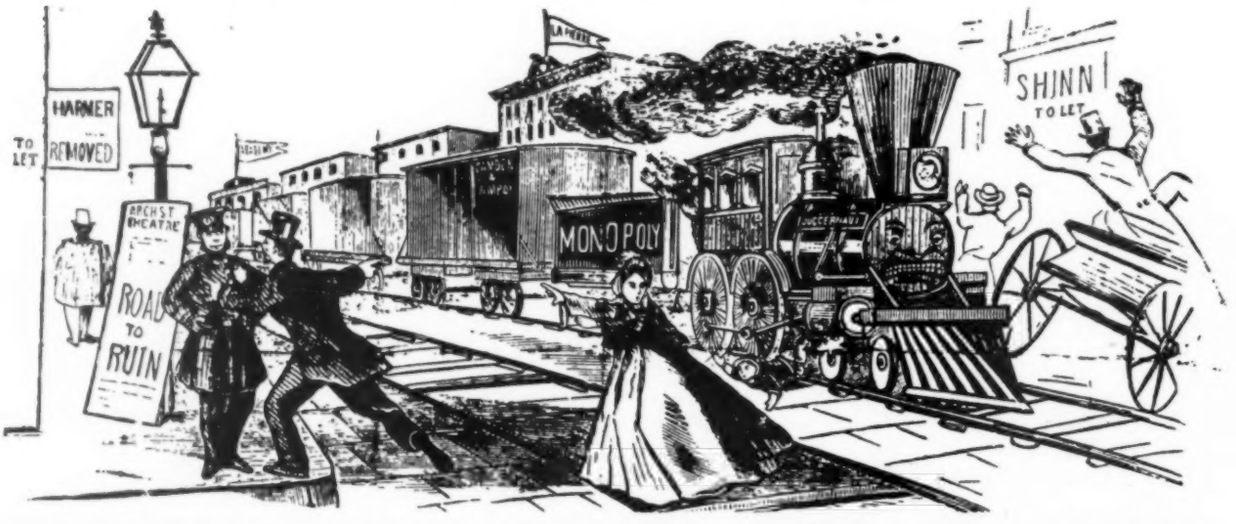
RAPID INCREASE IN URBAN TRAFFIC VOLUME INDICATED BY STUDY.—The rapidity with which urban traffic has increased in the past few years is indicated by a traffic survey conducted in Chicago by Dr. Miller McClintock, director of the Albert Russell Erskine Bureau of Harvard University. Fifty traffic-control stations in Cook County counted in 1924 and 1931 show an average increase in traffic volume of 90 per cent in the seven-year period. The increase ranged from 500 per cent to 2,200 per cent at four stations.

An Example of Opposition to a Then New Type of Transportation

A Photostat of a Poster Used in Philadelphia and Vicinity in 1839



MOTHERS LOOK OUT FOR YOUR CHILDREN!

ARTISANS, MECHANICS, CITIZENS!

When you leave your family in health, must you be hurried home to mourn a

DREADFUL CASUALITY!

PHILADELPHIANS, your RIGHTS are being invaded! regardless of your interests, or the LIVES OF YOUR LITTLE ONES. THE CAMDEN AND AMBOY, with the assistance of other companies without a Charter, and in VIOLATION OF LAW, as decreed by your Courts, are laying a

LOCOMOTIVE RAIL ROAD!

Through your most Beautiful Streets, to the RUIN of your TRADE, annihilation of your RIGHTS, and regardless of your PROSPERITY and COMFORT. **Will you permit this!** or do you consent to be a

SUBURB OF NEW YORK!!

Rails are now being laid on BROAD STREET to CONNECT the TRENTON RAIL ROAD with the WILMINGTON and BALTIMORE ROAD, under the pretence of constructing a City Passenger Railway from the Navy Yard to Fairmount!!! This is done under the auspices of the CAMDEN AND AMBOY MONOPOLY!

RALLY PEOPLE in the Majesty of your Strength and forbid THIS

OUTRAGE!

This photostat is of a poster which was circulated extensively in Philadelphia and vicinity in 1839.

Courtesy of The Highway Users' Conference

Use of Calcium Chloride for Construction and Maintenance

By H. F. Clemmer
Engineer of Tests, District of Columbia, Washington, D. C.

THE U. S. Bureau of Public Roads, through its soil department, believing that if the foundation of our pavements can be improved to insure definite supporting value, less expense would be required in the construction of a surface to carry even heavy-weight traffic and that under some conditions of traffic a satisfactory road may be obtained by proper treatment of the subgrade only without a high-type surface, are carrying on large research programs. Many of the state highway departments are co-operating with this bureau in constructive experimental road projects to check the laboratory test results.

Investigations are being made of both physical and chemical admixtures and the manipulation required to change clay, silt, or sand subgrade into semi-solid constant volume road slabs, capable of accommodating heavy traffic when surface treated or covered with relatively thin flexible wearing courses. The real problem is to create a subgrade which will not soften up in the presence of moisture, that is, one that will not readily absorb moisture.

Calcium Chloride as Soil Stabilizer.—A report of "Field Experiments in Subgrade Drainage and Treatment," presented by Dr. F. H. Eno, research professor, Ohio State University, to the U. S. Highway Research Board, in which many various materials and types of construction were included, shows the use of calcium chloride to be of direct value in stabilizing the soils on the experimental projects.

The Highway Research Board of the National Research Council, which is under the supervision of the U. S. National Academy of Science, realizing the importance of this problem and interested in the value calcium chloride has proven in the treatment of gravel roads, established a committee of engineers to study the use of calcium chloride for highway construction and maintenance. This committee was organized at the beginning of last year, 1931, and has maintained a research engineer to carry on investigations and correlate all available data. A progress report was presented at the annual meeting of the research board last fall.

Experimental projects have been constructed in three localities which offer widely different conditions as to weather and soil material.

The first project was located in South Carolina on a typical sand clay road carrying about 300 vehicles per day. The experimental section is six miles long, of which three were treated with calcium chloride.

The second project was located in Missouri on a typical gravel road constructed of fairly coarse material, which carries about 500 vehicles per day. The experimental road is eight miles long, two sections of 1½ miles and the remainder sections of one mile each. Every other section is treated with calcium chloride.

A third section was located in Nebraska, where the humidity is much lower, on a gravel road constructed of fine aggregate. This project is six miles in length, alternate mile sections being treated with calcium chloride.

One factor of interest in the Missouri investigation was a check made to determine the loss of road material by comparing the dust collected on treated and untreated sections. The results indicated that 50 per cent less dust and fine material was collected from sections treated with calcium chloride. Studies are being made on all these experimental projects to determine (1) the rate of evaporation of moisture from the treated and untreated road surfaces, (2) the ability of the calcium chloride to be adsorbed, or absorbed by the binding material (this would indicate what cumulative effect from continued application might be expected), and (3) to determine the saving in road metal due to the treatment.

Calcium Chloride as Dust Layer.—It is believed that the value of calcium chloride for dust laying is due to the remarkable affinity it has for water and its ability to retain moisture absorbed. This fact is clearly set forth in this report presented before the Highway Research Board. In the investigation reported, several samples of soil containing 5 per cent to 8 per cent moisture were placed in dishes and allowed to dry at a temperature of about 80° to 100° F. Several of the samples were treated with calcium chloride at the rate of 1¼ lb. per square yard, the remainder being left untreated. The untreated samples dried in three days, whereas it took 27 days to completely dry out the treated samples. The discussion of these results stated:

The untreated sample dried in three days, due to the fact that the water in it had a relatively high vapor pressure compared with that of the solution of calcium chloride having a low vapor pressure which was formed at the surface of the treated sample. All the water from the soil had to pass through this solution at the surface in order to be evaporated. This is similar to the action of calcium chloride when applied to a damp road surface following a rain. The solution formed near the surface of the road retards the evaporation of the moisture which entered into the road bed, preceding the application of the calcium chloride.

The object of the study during the past summer was to learn what became of the calcium chloride; that is, how best to conserve the calcium chloride. Three sources of possible dissipation were considered: (1) Rainfall, (2) chemical reaction with soil (base exchange), and (3) maintenance manipulation.

(1) The loss of calcium chloride due to the washing out effect of rains depends on the type of rains, the permeability of the soil for water and the composition of the soil. The greatest loss from this account would be when a heavy rain might occur immediately following the application of calcium chloride.

(2) The loss due to chemical reaction or base exchange is dependent on the chemical composition and the degree of acidity of the soil system. This loss is mainly due to the absorbing of the calcium chloride by the soil with the liberation of an equal amount of another base which recombines with chloride. This has been offered as an explanation as to why subsequent treatments seem to offer more definite value, that is some of the calcium chloride applied on the first treatment may have been dissipated by this base exchange, however, further application would not be affected in this manner.

(3) However, the most important factor causing loss of calcium chloride was the effect of continued daily maintenance. Sections maintained only immediately after a heavy rain or except when absolutely necessary remained in much better surface condition and far less dust resulted from comparative traffic than on the sections receiving daily maintenance. The investigation shows definitely that better results will be obtained and more value derived from the use of calcium chloride if regular maintenance is carried on only immediately after rains. Maintenance at other times tends to loosen the surface and dissipate the calcium chloride. Since calcium chloride is an indestructible material under ordinary conditions encountered in highway work, its effectiveness can be destroyed only by its removal from the road. A more compact surface with a minimum of maintenance insures the greatest service from the calcium chloride.

Important Factors Resulting from Application.—The use of calcium chloride for treatment of gravel roads has oftentimes been with only the thought of alleviating the dust nuisance and the engineer has not realized the many other important factors resulting from its application. Investigators interested in this problem now are studying the many beneficial effects the calcium chloride creates towards improvement of the condition of the soil for a satisfactory road surface, and they consider the alleviation of the dust nuisance, which is in reality a most dangerous factor, as one of the added benefits derived.

One value of calcium chloride is its ability to flocculate soils, that is, to cause small particles to group together into larger ones so as to form a more open and permeable soil. This effect is most important in reducing the destructive action caused by freezing. The more open soil does not hold the moisture which when frozen creates the expansive forces.

In addition to being a most excellent dust palliative, calcium chloride acts as a binding agent and greatly reduces the loss of road metal. The Bureau of Public Roads has made the statement that the annual wear on gravel roads is equivalent to ½ to 1 in. of surfacing material, which, in the case of an 18-ft. surface, would be 150 to 300 cu. yd. per mile. Where calcium chloride is used the loss of material is reduced to a minimum. The cost of using calcium chloride is approximately equal to the cost of the extra replacement of gravel required where calcium chloride is not used; however, the application of calcium chloride insures the alleviation of dust, while a replacement of gravel offers no such assurance. That is, as stated by a representative of one of the states using large quantities of calcium chloride for maintenance, "It costs nothing to use calcium chloride . . . if we don't use it we pay an equal amount in replacing the gravel."

Application of Calcium Chloride.—Maintenance engineers regularly using calcium chloride do not believe that it should be applied at any specific rate, but rather depending upon the amount of traffic carried by the road. The following table is typical practice under general conditions:

	Per sq. yd.
100 to 200 vehicles per day	1 lb.
200 to 500 vehicles per day	1½ lb.
500 to 1,000 vehicles per day	2 lb.
1,000 and up vehicles per day	2½ lb.

The best practice of applying calcium chloride is to make several applications. For example, should the road require 1½ lb. per square yard, it would be advisable to make one application of 1 lb. per square yard and follow with a second application of ½ lb. at an interval of approximately six weeks, depending upon the prevailing weather conditions.

How to Use on Gravel Roads.—A summary recently offered by the Maintenance Committee of the American Road Builders' Association presents the following outline for the proper use of calcium chloride on a gravel road:

(1) Remove oversize material.

(2) Add to the gravel the constituents it lacks, either sand or clay.

(3) Scarify the surface and thoroughly mix all material added.

(4) Maintain not more than ½ in. to the foot of crown.

(5) Remove all cover and apply calcium chloride.

(6) Blade carefully after each rain and at such other times as the surface of the roadway demands it.

(7) Patch any holes with the same material as used in the entire surface.

(8) Use heavy equipment for spring work.

Conditions that demand heavier application of calcium chloride are long dry spells, heavy traffic, low clay content, recent heavy resurfacing, no shaded portions, heavy wearing cushion and dead material. Conditions favorable for lighter application are frequent rains, light traffic, heavy clay content and shade.

In addition to the results reported above, experiments were made on each of the research projects under the direction of the Highway Research Board as to the effect of artificial rain on the water retaining capacity of a calcium chloride treated soil. A complete report of this research will be presented at the annual meeting of the board in December. The experimental sections constructed to study this problem will be followed next year and further laboratory tests will be conducted to check the phenomena observed in the field.

That this problem is worthy of further study is evidenced by the facts established and the improvement in road service which may be obtained with a saving as to necessary maintenance and the amount of calcium chloride required for treatment.

Acknowledgment.—The foregoing is an abstract of a paper presented at the 1932 convention of the Canadian Good Roads Association.

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Layout Platform for Concrete Arch

An interesting feature in connection with the construction of concrete arch bridges over Cedar Creek and Big Dann Creek on a highway relocation project in District No. 1 of the California highway system was the use by the contractor of an arch layout platform. These arches, while of slightly different shape and rise, are of equal span, 320 ft. Both spans are high above the bottoms of the canyons, the Cedar Creek bridge being 225 ft. above the bottom of the creek and the Dann Creek bridge 185 ft. The slopes are steep and covered with loose material. Construction of falsework and forms in place therefore presented costly difficulties.

The contractor solved the problem by establishing a storage yard and plant on the high ground between the two bridges, performing all carpentry work under ideal conditions. From the yard the completed units of forms and falsework were transported to the bridge sites by industrial cars and high-lines.

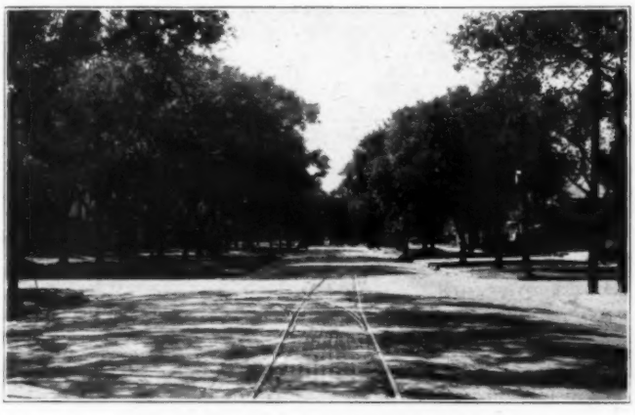
The full-size platform was built for the layout of one-half the arch face. On it was laid out to actual size the form and falsework construction. The two halves are symmetrical but a slight modification was necessary for the second bridge.

Widening and Resurfacing West Tenth Street, Topeka, Kansas

By W. A. Lawson
Commissioner of Streets and Public Improvements, Topeka, Kans.

WEST Tenth Avenue in Topeka, Kan., is an important trafficway leading from an important, densely settled residential section to the business district center.

This street was an old brick street, paved in varying widths and being extended at various times as new additions were developed and incorporated within the city limits. The street, for the major portion of its length, carried street car lines, part being double track and the remainder being single track.



The Old Street with the Car Tracks

The pavement on all but a few blocks of the most recent construction, was of a type known as two course brick pavement. In the type of construction the street was excavated to grade, sand cushion was spread and on this sand cushion a layer of brick was laid flat and the joints filled with sand. This was used as a paving base. On this brick base course, a brick wearing surface was laid. The bricks used on the older sections of this street were of a type known as repressed bricks. The street had become very uneven, and due to this and insufficient width, severe traffic congestion developed. In order to relieve this condition it became necessary to widen and resurface the street.

How the Improvement Was Financed.—One of the first obstacles to overcome in the resurfacing of this street was the financing of the improvement. Under the Kansas paving law existing at the time it was agreed that it had become necessary to widen and repave to relieve the traffic congestion, the expense of improvement had to be carried by a benefit district extending one-half block on each side of the improvement.

The property owners liable for the cost of widening and repaving had a right to protest, and on that account it was found it would be impossible to make the improvement under the existing law. Since similar traffic congested conditions existed in all first class cities in Kansas, it was decided, by these cities, to appeal to the 1931 Legislature, seeking relief through that source.

The Legislature, in response to requests from the first class cities, enacted a law permitting the financing of widening and repaving important trafficways, the cost of the improvement to be borne by the city at large. The West Tenth Street project was financed and improved under that law.

The next obstacle to be overcome was removal of the street car lines from the street. The city officials decided that it would be impossible to secure the desired traffic relief unless the street railways tracks were removed. The street railway company's officials finally agreed to the removal of the railway tracks and replacing the old railway cars with electric trolley motor buses.

The portion of West Tenth Avenue which the officials decided it was necessary to improve, extended from Jackson Street to Washburn Avenue, a distance of 32 blocks or 8,891.3 ft. The widths to be paved, as decided by the officials, were as follows:

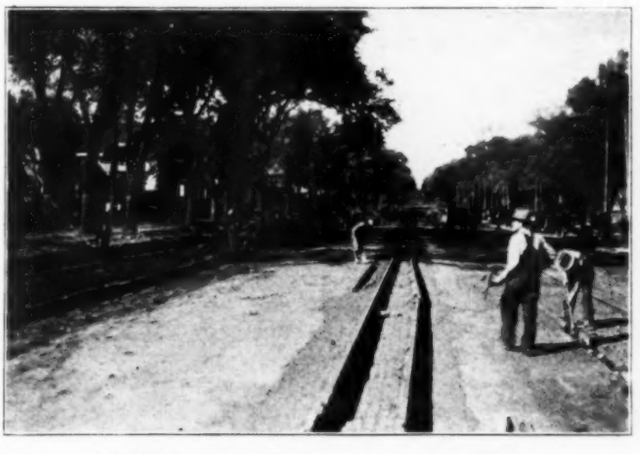
From Jackson to Western, a distance of 7 blocks, a width of 70 ft.; from Western to Clay, two blocks, a width of 60 ft; from Clay to Lincoln, two blocks, a width of from 60 to 52 ft.; from Lincoln to West, two blocks, a width of from 52 to 45 ft.; from West to Boswell, five blocks, a width of 45 ft., and from Boswell to Washburn, four blocks, a width of from 45 to 34 ft.

The plans for widening the street called for a new combined curb and gutter and a new concrete base under the widened portion of the street. The old brick pavement on that portion of the street already paved, was used as a base for the new paving surface.

The wearing surface selected for surfacing the street consisted of a binder course which filled up depressions and evened up to true contour the old paving surface. Over this binder course was laid a sheet asphalt wearing surface one and one-half inches in thickness.

Contracts for widening and resurfacing were let and completed in the late fall and early winter of 1931.

The contract included 57,452.3 sq. yds. of sheet asphalt paving at a cost of $57,416.95, and 5,963.3 tons of asphalt binder at a cost of $42,628.99. The total cost of the improvement, including excavation, combined curb and gutter, new concrete base, surfacing and all



Widening Street Preparatory to Resurfacing

other incidental items connected with the widening and resurfacing, amounted to a total of $211,027.76.

The sheet asphalt wearing surface is composed of a dense close mixture, graded approximately as follows:

	Per Cent
Bitumen	8.2
Passing 200 mesh screen	21.7
Passing 80 mesh screen	8.5
Passing 40 mesh screen	37.2
Passing 10 mesh screen	24.4

Texaco No. 54 paving cement was the asphaltic material used throughout the construction of the asphaltic wearing surface.

The Kaw Paving Co. of Topeka, Kan., had the contract for the sheet asphalt wearing surface. The work was directly under the supervision of the author, Commissioner of Streets and Public Improvements, and W. E. Baldry, City Engineer of the City of Topeka.

The Widened and Resurfaced Street

The improvement was badly needed; was economically and scientifically designed and constructed, and has relieved a badly congested traffic condition.

A traffic count, between the hours of 7:00 a. m. and 10:00 p. m. at Topeka Avenue and West Tenth Avenue, showed 10,213 vehicles passing on West Tenth Avenue during that period.

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Bad Road Manners Materially Reduce Efficiency of Highways

Bad motoring manners, the rule rather than the exception on our streets and highways today, effect a reduction of at least 25 per cent in the effectiveness and efficiency of the country's highway system, according to Dr. Miller McClintock, director of the Albert Russel Erskine Traffic Bureau of Harvard University.

"In building roads, traffic engineers evaluate the usefulness of the improvement in terms of its physical factors. In other words, a highway so many feet wide and of such and such a construction is assumed to accommodate so many cars per day, if traffic is moving at an average—determined by existing speed laws and safety standards—of so many miles per hour.

"As a theoretical basis for calculation, the premise is fair enough. But it fails completely to take into account the all-important human element which, when all is said and done, determines the practical value of the facility. It is the man behind the wheel and not the car that determines how close the practical value of a highway approaches its theoretical potential.

"Actually, experience reveals that the average motorist gives little, if any, thought to anything beyond that small strip of pavement which he may happen to be occupying at the moment. It is perhaps too much to expect that he strain his imagination to the point where he can view himself solely as a single cog in a huge traffic machine which will work perfectly only so long as all the cogs are operating in harmony. Human nature doesn't seem to work that way—at least in so far as motoring is concerned.

"Let's take a look at the situation in its broadest aspect and view human behavior under these conditions.

"Thirty-two million Americans drive twenty-six million motor vehicles, totaling nearly one billion horsepower, five hundred and sixty million miles a day. There, in plain, cold fact, is stated a tremendous situation. To put it differently: Thirty-two million persons are found legally capable of handling, and are entrusted with, the control of one billion horsepower.

"By and large, the motor car of today may be considered pretty nearly perfect mechanically. But in making the machine fool-proof, we seem to have overlooked the fact that fool-proof means proof against fools, and have done little or nothing to assure the mental stability and physical stamina necessary to control safely so powerful and dangerous a force.

"We may take for granted, however, that the great majority of present day motorists in America possess an elementary ability to navigate a motor vehicle. Proceeding from this, we come to the one important situation which is largely responsible for most of our highway troubles. What the average driver needs more than anything else is to remember his normal courtesy. It is safe to say that the manners we take out on the road with us are beyond question the worst manners we have.

"Why is it that men and women, normally courteous and considerate in their daily intercourse, should of a sudden revert to selfish, snarling savages the minute they get behind the wheel of an automobile? Yet, it is a condition which every fair-minded motorist will readily admit.

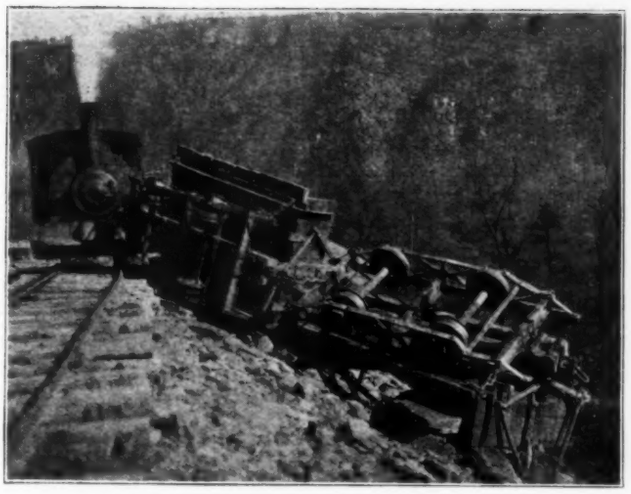
" 'Courteous drivers will keep to the right.' Where you see that sign, you will at once be able to estimate the precise paucity of courteous drivers. They are all over on the left. Look at that scoundrel now, turning off suddenly without an inkling of a signal. Might have wrecked us all! You decide to park along the curb. Listen to them honking indignantly behind!

"None of us need reminding to think of scores of similar outrages perpetrated upon us by the other fellow. And, to tell the truth, neither do we need reminding of the numerous occasions when we ourselves were guilty of equal rudeness and discourtesy.

"The psychologist can undoubtedly offer many good reasons for bad road manners. But these do not concern us for our immediate purpose. It is intended here only to point out the adverse economic results of such conduct as it relates to the efficiency and usefulness of our highways.

"When a motorist, driving mainly for pleasure, maintains a snail's pace on the inside lane of a 40-ft. highway despite the oft-repeated exhortation to 'use the outside lane except when passing,' he displays himself as a selfish boor utterly indifferent to the interest of those behind him who may desire to maintain a reasonable speed or whose business may demand that they get to their destinations in a hurry.

"For all the roadhog cares, the other fellow may risk the chance of serious accident by passing on the wrong side, or encroaching on the half of the road reserved for oncoming traffic. Again the driver, who, on a narrow pavement in dense traffic selfishly insists on pushing out of place for the debatable advantage of a few yards, jeopardizes not only his own safety but worries and delays those around him.



Accident Prevention in Highway Construction

By Thos. W. Walton
Comptroller Henry W. Horst Co., Contractor, Philadelphia, Pa.

In some states there are erected at particularly dangerous highway crossings or curves, white crosses, one for each fatal accident that has occurred at any particular spot so marked. Gruesome but effective, their white arms bear silent witness day and night to the dangers of the road. No one likes the sight of these reminders, least of all members of the families of those whose lives have been there snuffed out.

I have often thought that it is well for the comfort of those of us who have had to do with the construction of highways that there are not crosses of another color—some of them red, perhaps—telling of other lives that have literally gone into the construction of the highway. But were we to place reminders of some type along the highways for all serious accidents—all lost-time accidents, let us say—it would be an unfeeling contractor indeed who would not leave his car behind whenever possible to ride the rails or take to the air.

Now could I tell you today just how to build roads so that there could be no mental markers of accidents, then should I have willing listeners indeed, and then would there go out from this conference many a man determined to build as his own monument the first "no-accident-built" highway. However, the fact that we cannot hope to reach perfection in a day does not mean that effort is useless, and in these days most of us do not have the alibi of too many contracts on hand to think on these things. Furthermore, there is the possibility that the sobering experiences of the past 2 or 3 years have put us in frame of mind to consider things fundamental—and to consider them seriously.

We must do things in our own way. We gain much from contact with our neighbor. We may benefit immensely from conferring with those in the same or like lines of work and find much we can use. (The National Safety Council knows this.) But you and I cannot change ourselves and do our tasks as John Jones does his. Each may adapt certain things to himself, yet each must do his work in his way. Each, with his own problems in mind, let us begin our present task by considering:

Some Minimum Essentials.—Just a few points which any organization should consider as essential:

1. Experienced, dependable superintendent. Clear of vision, free of bias, fair in all dealings; above all, considerate of his men. A satisfactory combination of these qualities is not easily found.

2. Simple, but clean and adequate headquarters where careful records are kept, first-aid materials are always on hand, and where first aid is freely administered with clean hands.

3. A requirement that all injured persons report promptly for first aid; that field men report in triplicate, on insurance forms, every accident regardless of how minor. One copy goes to insurance carrier, one to home office of employer and one to field office files.

4. Public liability and property damage cases reported with same care and with names and addresses of witnesses included.

These have been requirements in our company for years and it is surprising how often any deviation from regulations or delay in carrying them out causes trouble. Today I am going to add one more to the list, which, I believe, you will agree, should be classed as an essential:

5. Skilled mechanic who knows and keeps in proper repair all equipment; who does not wait for reports of evidence of needed repairs (which should be made, to be sure), but who examines all equipment and allows none to be used that is not in first class condition. On small contracts this man can also look after small tools, explosives, etc., but he must be an unfailing, dependable mechanic. Safety must be in his blood.

These are positive essentials. A negative essential which we shall not dignify with a classification number is no drunken drivers. There must be no shadow of doubt here..

Have you observed all these essentials and more, and yet lack your coveted safety record? Even so,

Discouragement Must Have No Place in Our Program.—Distressing experiences do come. There is no gainsaying the fact that many a contractor feeling himself in control of the situation has suddenly awakened to the fact that the sword has fallen, sadness and suffering have come to the lot of employes or employes and dependents; investigation shows contributory negligence on the part of the injured, and with vision of rising rate curves the contractor is likely to feel, "What's the use? Men will take chances they have been warned against. Why not save the effort and expense put into the safety program? That bit would certainly be used somewhere else these days." Not so, men, such would be the costliest saving we ever made. Usually I like an illustration of a positive nature, one that shows how much better some company's experience has become after having intensified the safety drive. This time let us use a negative illustration:

Secretary Samuel S. Lewis of the State Highway Department of Pennsylvania on taking charge of his

department learned that there was little thought being given to the safety of the 30,000 workers coming under his care. Even though the state, through its Department of Labor and Industry, enforces consideration for safety in private industrial organizations of any consequence where such is not voluntarily given, there had been no safety organization and little consideration to state safety regulations for protection of industrial workers applied to the State Highway Department. An examination of records revealed an appalling accident rate. Mr. Lewis in setting about to remedy matters found the same difficulties that are found elsewhere—only he found them harder to cope with than contractors do, for the simple reason that contractors have been longer on the job, and their men are beginning to respond. For example, he found men so likely to disregard the use of goggles where needed that it was necessary to post a notice that anyone guilty of such neglect would be dismissed, and in case of accident because of neglect, foreman or superintendent responsible must also go.

Be this said to the credit of the contractors. Some of their effort is telling; records speak. To quote from a state report: "While the accident experience of these latter groups (state employes) is not reflected in the manual rates of private employers—it would be illogical to omit them from a study of paving and road construction accidents, despite the fact that their contribution to the record builds up a much more adverse experience."

All of this goes to prove that slow though it may seem, the leaven is at work in the forces of the general contractors, and high though our frequency rate be, it is not nearly so high as where similar effort has not been expended. Let there be no let up—for both humanitarian and economic reasons let the effort be redoubled. There is no place for discouragement in our program.

The Gospel Must Be Spread.—If we have something worth while we must tell it. That is simple application to the Golden Rule. We must be safety missionaries.

In these times of unusual shortage in construction work in general, many contractors who have never before built roads are seeking to enter the field. Naturally, hazards—new to them—arise. Costs are increased. All have cut to the quick in preparing bids, and in carrying out the contracts one of the first temptations that they face is that of eliminating or at least reducing the safety program. Preach, men! Tell these men of the hazards. Tell them that not only because of their own inexperience in this line should unusual care be exercised, but also because of the likelihood that in their employes on the road job there are many men who have hardly had tools in their hands before. Formerly white-collared men, they have turned to labor these days, and willing and teachable though they may be, and though more efficient than the average workman they may become, for the time being, they constitute the awkward squad and may easily and often be in the way of the wrong object. These men all of us may have in our organizations, but the contractor new in the road building line will be likely to have them in great proportions. Let us be safety missionaries.

We have said we are in position to consider fundamentals today, and to consider them seriously. When we see a damaged car or a broken piece of equipment our first question is "Was anyone hurt?" This sounds and is humanitarian. However, is it possible that it sounds as though we, as contractors, are more humanitarian than history shows us to be? We are interested in the injured—and in their families. We should like to help the widows and the little ones left fatherless. In fact, we carry insurance, whether required to do so or not, and records show that in general more care is being exercised than formerly; safety programs are followed; safety engineers are being employed; and the gathering at this Twenty-first Annual Safety Congress in itself bears evidence to increasing interest in safety. Employers are not without sympathy. Men cannot be unmindful of the fact that the United States Census Bureau records show that among men accidents are the second most important cause of death, claiming larger numbers than any other cause except heart disease. Neither can the fact be forgotten that the reports of Industrial Commissions of Pennsylvania for year ending Dec. 31, 1930, and of Massachusetts for year ending June 30, 1931, show that of all cuts and lacerations one in six becomes infected. It is impossible to conceive of a group of intelligent men who would not be interested in such facts.

$3,000,000,000 *Loss Due to Accidents.*—However, in the hearts of the officials of the National Safety Council I am wondering if there is not an awareness that certain other statistics—in their effect upon us—have been more telling as a whole. A great insurance company, following a very exhaustive study, estimates the yearly direct loss of accidents at more than $912,000,000.00. (This is in compensable and liability claims and medical treatment.) The same study estimates indirect losses after having analyzed 10,000 cases, varied as to kind and geographical location, at 4 times the direct cost, or $3,650,000,000.00! Add the direct cost (and get the decimal point in the right place) for a total of $4,560,000,000.00! Talk about budgets! The figure is so stupendous—so impossible of comprehension that we may as well cut it—it is such a satisfaction to reduce figures when they are on the expense side these days—cut one-third off and still have $3,000,000,000.00!

Now with 60 per cent to 75 per cent of accidents preventable think of the possible saving—think of the present burden! Do these facts—is this overhead—equally telling with the humanitarian interest in developing safety programs? Have we ever become particularly shocked at our accident record and more actively interested in a safety program after we have found our insurance rate mounting? Let each one of us in his heart give thoughtful answer. . . .

It does not take long, men. If you have answered in your heart as I have answered in mine, the answer is one in which we feel no particular pride. Not for a minute would I forget the worth-whileness of such studies as the one summarized in that insurance company's report just referred to; not for a minute would I minimize the efforts of the National Safety Council to bring before us forcefully the findings of companies who have launched whole-heartedly into the safety campaigns and have found financial gain by so doing. May the Safety Council continue these tactics, and may more of us save, and save more by more carefully observing safe practices—but may we be more mindful of the humanitarian side!

Getting Safety Over.—Let us post the jobs well with the fine safety posters available these days. (If we do not take these simplest of precautions and an accident happens where does a large share of the responsibility lie?) Let the men know we are thinking safety—and thinking it primarily for them. Gradually they will get into step. Let us impress upon the foremen and superintendents that they are personally responsible for the life and limb of the men under them. Example talks. (We no longer have in our employ the superintendent we actually found riding up from a pit in clam shell

bucket.) Literature should be placed in the hands of the men accompanied by a pleasant word as it is passed out at the noon hour or some unhurried time. Let us show them our personal interest, and talk with them about their families—their children. Cooperation will grow.

There are indirect ways of getting safety over just as there are indirect costs to accidents. The poor man pays more for everything—for his coal, let us say, than we do. He buys in small lots—on time—pays the top notch price, gets poor service—and pays the premium because he cannot take the discount. Little thrift talks or folders help—tid-bits here and there in our safety literature that will make everyone in the family want to keep and read the booklets. A recipe for some nourishing, appetizing, inexpensive dish will do triple duty—even a simple fashion hint will create interest in surprisingly many humble homes. Other opportunities to show interest will present themselves frequently. For example, during an epidemic, a mimeographed or printed slip giving information and suggestions, and bearing the company's name will help immensely.

Human Relationship and a Safety Program.—In just so far as that is the view point of the general contractor—in just that far will his employees become in his "modus operandi," but so much energy and force. What has this to do with building highways safely? This: The employee who is so considered, senses it even, perhaps, though his employer himself is hardly conscious of so considering the employee. The employee knows it even though he may not be able to frame it in words. He may work faithfully and well—partly because he is naturally a good worker, partly because of necessity. However, efficiency in a safety program anywhere depends upon the human relationship to a far greater extent than we have been accustomed to think.

Have we regarded the thought of the employee—his feeling, somehow, as different from our own? Is pain or denial as much to him as to ourselves? As Josiah Royce says in speaking of his neighbor, is he less living than we are? Is his life dim and cold and pale beside our rushing, burning desires? Let us have done with this illusion, and let us have truth. Pain is pain—joy is joy—denial is denial wherever it exists. If we do not recognize it, it is because of a selfish throb in our little hearts, while if we do recognize it we have already taken a long step toward the solution of a problem that has baffled us all these years.

By sheer force we may keep the safety curve moving in the right direction—but the thing we want is the decided drop—and with no 60 per cent to 75 per cent of reported accidents "preventable" in nature. I am neither a prophet nor the son of a prophet, but I venture the prediction that these percentages will never be cut to the point that we can say preventable accidents are 20 per cent to 25 per cent of the total until the real effort comes from the inside and by "from the inside" I mean from employees in whole-hearted cooperation with our whole program.

I am not here with "sobstuff." I have not enumerated pitiful stories. Heaven knows they are familiar to all of us, but I do bear a brief for a new day in human relationships; and I trust I am not merely the voice of one crying in the wilderness when I declare to you that when we reach the point of proper human relationships with our employees not only will our roads be better built, not only will they be more quickly built (is there an appeal to that?) but they will be more safely built because of the development of pride of the worker in his task and in the undertaking of his employer; because of the undimmed lights in the homes where no accidents have been experienced; because of the joy in the lives of the employees.

Put it on the money basis if we must, save with safety, yes, but preferably let us do it from the humanitarian standpoint, and through improved human relationships and then will these other things be added unto us.

When this spirit "be in us and abound" we shall build highways that are not barren, except for riding upon, but that have been fruitful not only in support of employees and employer alike but in improved human relationships—the only effective weapon against the red menace we face today. Then shall we see the safety norm lowered as it were, and then shall we see afar off and take each new contract with added vision.

Acknowledgement.—The foregoing is an abstract of a paper presented at the 21st Annual Safety Congress and Exposition, held Oct. 3-7 at Washington, D. C.

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Southwest Road Show and School Set for 1933

In announcing the next Southwest Road Show and School for Wichita, Kan., in February, 1933, Fred G. Wieland, General Manager, is going on the theory that these times are normal for the man who waits for something to turn up, and that the organization which waits for its ship to come in may find it to be a receivership.

"With the country all set for recovery, this is no time for 'watchful waiting'," says Mr. Wieland, who points out that road building is still going strong and industrial building is gaining. The Southwest still has many miles of road yet to build, and roads that are built must be maintained and kept in repair. Wichita is the central distributing point for a huge territory in which highway building and construction work still plays a leading role.

"Six annual Road Shows in Wichita in the past seven years," says Mr. Wieland, "have brought together highway and industrial contractors, state and federal highway engineers, county commissioners, besides thousands of others interested in better roads and better equipment for their construction. Valuable trade contacts have been made by manufacturers and distributors of these at these six shows. There was no show in February in this year, and a consequent loss of contact with potential and actual buyers which must not be allowed to continue for the good of the industry. As a result of no show this year, there should be bigger exhibits and a larger attendance at this Southwest's Largest Exposition in February, 1933, than there has been at any prior exposition.

"With national elections out of the way, with a vast market open to every ambitious manufacturer and distributor in replacing outmodeled and obsolete machinery, with hoarded buying power loosening up, with confidence returning rapidly, there is no reason why the 1933 Road Show and School cannot be more of a success than ever. The Southwest must still be served. The man who proposes to sell it 'short' indefinitely will find himself out of the picture. The need of the hour is courage, courage of the quality that wrested this country from the wilderness. Directors of the Southwest Road Show and School have that type of courage. They feel sure, moreover, that manufacturers and distributors of road-building and road-maintaining equipment will go the limit in supporting next year's exposition."

The exact dates of the above outstanding show are Feb. 21, 22, 23, 24, 1933.

. . . EDITORIALS . . .

The Battle of the Railways Against the Motor Trucks

IN Texas, trucks hauling to and from a railroad may carry loads of 14,000 lbs., but only half as much elsewhere. This law has been upheld by the U. S. Supreme Court, whose decision reads: "It is said that the exception was designed to favor transportation by railroad as against transportation by motor trucks. If this was the motive of the legislature, it does not follow that the classification as made in this case would be invalid. The State has a vital interest in the appropriate utilization of the railroads which serves its people as well as in the maintenance of its highways as safe and convenient facilities."

It is evident from this decision that the Supreme Court regards the Federal Constitution as being without power to prevent a State from discriminating in favor of one common carrier as against another where both are engaged in interstate transportation, provided that the discrimination can be concealed under some plausible guise. Since fair treatment of interstate carriers using the highways is not be to be secured under the Federal Constitution, attention must be concentrated upon State legislators. There, however, the railways have stolen a march upon the truck owners. In Kentucky, for example, both houses of the legislature have just passed a bill sponsored by the Kentucky Railroad Employers and Citizens' League, the object of which is to regulate trucks and increase their taxes. In "Railway Age," Oct. 29, one of the members of that league said: "In entering the legislature we found that we had almost no enemies; almost all the members were our friends." Since all the members of the lower house and half of the State senate were chosen at the last election, there had been ample opportunity for the league to support candidates by their votes and thus secure the desired "friendliness" toward their bill. According to a Nov. 18 "release" by the National Rivers and Harbors Congress, "This friendliness was clinched by the presentation of 63,000 petitions, so the bill presented by the league to regulate trucks and increase their taxes passed the Kentucky senate by 34 to 1 and the house by 88 to 5." This same "release" also says:

"Organizations composed of railroad employes, their relatives, and any others who can be induced to join, are doing some very effective work. Committees call on merchants, distribute cards reading, 'You ship with us; we shop with you,' and ask pledges not to ship by boats or trucks but altogether by rail. What they have done to the trucks in various States is suggestive of what may happen to the boats when they get ready to turn their attention in that direction.

"The local leagues of railroad employes and their relatives and supporters which are being formed all over the country are being merged into State organizations and these are uniting to form a national association. Opposition to waterways is a part of their program and, when they think the time is ripe, an anti-waterway bill will be introduced in Congress. Every candidate for the house or the senate was 'labored with' by representatives of these organizations before the recent election and, with the addition of hundreds of thousands of petitions and the help of owners of railway securities, they hope and expect to put their bill through Congress as deftly and surely as they put the motor-truck bill through the Kentucky legislature."

Among the subjects that will be discussed at the annual convention of the American Road Builders' Association at Detroit in January, there is but one that will exceed in importance the question of how to overcome railway propaganda against highway users. A more important problem is how to prevent diversion of gasoline taxes and license fees from their proper use in building and maintaining highways. Upon these two problems there should be directed much of the energy of all who are interested in a resumption of rapid progress in highway transportation.

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The Ancestors of the Depression of 1929

THE Chicago Tribune, in a recent editorial article, quoted from the writings of public men and from newspapers, five different paragraphs, each of which related to distressing economic conditions during the panics of 1824, 1837, 1857, 1873 and 1893. Any one of the quotations was equally applicable to present conditions, for all were extremely lugutrious.

Therefore, when we read that the present depression is "the worst ever," we should hesitate about accepting the statement unless by "ever" the writer means a period somewhat less than two generations.

The theory that "technological unemployment" is the cause of this depression is not a new explanation of depressions, although the name that it now goes by is eminently new. There has been "technological unemployment" here and there ever since Watt gave to the world an economical steam engine. Probably that sort of unemployment started when a Chinaman invented a wheelbarrow. The ancient nature of unemployment consequent upon invention is conceded by all economists, we believe, but recent revivalists of this theory of hard times argue that during the decade ending in 1929 labor-saving devices were designed and installed at a rate so unprecedented as to constitute an economic revaluation. This is not true.

The "technocrats" have been particularly active in printing data showing how rapidly workmen have been replaced by "robots" of one sort or another. It is noteworthy, however, that the advocates of general curtailment of output rely upon individual instances and upon facts relating to a few industries, to prove their case. The same sort of "proof" was offered a century ago, and all that was wrong about it was that desire for goods and services outruns the means with which to purchase them. Let a family double its real income and how often does it fail to spend it? Double it again, and is there any difficulty in finding ways of spending it? Not if the history of the past century is any criterion, not if the families that now have an income of $10,000 a year are composed of the same stuff that goes to make families having incomes of $2,000.

Technological unemployment does occur at intervals in every class of industry but seldom in many classes simultaneously. What is more important, human wants expand as fast as real income expands; and since average real income depends upon average per capita output of goods, it is an economic error to attribute depressions to general overproduction.

During the boom of 1928 and 1929 when production was at a peak, where was there a piling up of many unconsumed goods? Even the most over-expanded of the large industries, namely farming, was not suffering from accumulated surpluses. Farm prices were said to be too low to be profitable; but when was anything else ever said by the average farmer? Taken as a whole, neither manufacturers nor merchants were overstocked when the collapse came in 1929. What collapsed? Store shelves? No. Grain bins? No. Automobile storehouses? No. What collapsed was credit. There had been a drastic shrinkage of credit on real estate projects in many cities even two years prior to the collapse of credit on Wall Street. The grand collapse of credit on securities bought on margin was immediately followed by a collapse in bank credits, which was further aggrevated by the failure of more than 2,000 American banks. The calling of bank loans forced the sale of securities at still lower prices, and this in turn resulted in the calling of more loans. There were "vicious circles" without end, but observe that in nearly every instance they existed mainly because both ordinary business and speculation are largely conducted upon borrowed money.

Overproduction of credit has apparently been far more detrimental to prosperity than any other cause, perhaps than all other causes put together. An overproduction of any given class of goods usually rights itself because of the unprofitable prices that result. But overproduction of credit is apt to become general, and when it reaches that stage it rights itself by a general collapse of all business.

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The Alleged "Hall of Fame"

OF the first 63 names selected for the "Hall of Fame for Great Americans" only one was a civil engineer and that one had done nothing remarkable from an engineer's point of view. We refer to James B. Eads who built jetties at the mouth of the Mississippi during the civil war. Only one other whose memorial tablet was placed among the 63 can be classed as an engineer, namely, Robert Fulton, inventor of the first economic steamboat. Only four other inventors are to be found in the list of 63, namely, Cooper (locomotive), Morse (telegraph), Whitney (cotton gin), and Howe (sewing machine).

No one is eligible for entablature in this "Hall of Fame" until he has been dead 10 years. Judging by the 63 names, the longer dead the greater the eligibility. Jonathan Edwards, colonial preacher, is there. Cooper, teller of frontier tales, is there; and so is Daniel Boone, "The Pathfinder." Three early orators—Patrick Henry, Henry Clay and Daniel Webster—are there. Seven presidents and three civil war generals are there. Four women whose names the editor knew, and three whom he had never heard of, are there. But we look in vain for a single mathematician, a single astronomer or a single chemist. There is one physicist and three naturalists, but no geologist unless Agassiz be so regarded.

America leads the world in railway development, but no railway builder is among the 63 "immortals." Howe of sewing machine fame is there, but Howe of bridge fame is not. Electric traction had its birth and development here, but the "100 prominent citizens" who selected the 63 "immortals" did not know it, or knowing it, thought its inventors less great than Emma Willard. Americans have revolutionized agriculture by inventing farm machinery, but a McCormick was rated as less great than Mary Lyon. The power-drill, the rock-crusher, the hydraulic-dredge, the road-grader, the concrete-mixer, the machine-gun, the cash-register, the typewriter, the linotype, the Hoe press, and world of other mechanical devices, are American. But the inventor of not one of them was worthy to rate above Maria Mitchell or Mark Hopkins!

Pure science and engineering were evidently almost unknown realms to the "100 prominent citizens" who selected these 63 "greatest Americans." Another 87 names will be selected, at the rate of one a year, until the "Hall of Fame" is full—full of what? Bronze tablets to the number of 150. And when men, four generations hence, read the 150 names they will smile sardonic smiles. They may even grin at "Fame." Of a certainty there will be grins at the "100 prominent citizens" who here recorded their conceptions of human greatness.

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A Proposed Amendment to the Reconstruction Finance Corporation Law

ALTHOUGH road improvement in most states is self-liquidating, in point of fact, yet the federal law seems to exclude it from that category of public works, for the law prescribes that repayments of federal loans to states, counties, and municipalities must not depend upon taxation. It was obviously the intent of congress to prevent an increase in the present local tax burden, but congressmen overlooked the fact that the gasoline tax is virtually a toll for the use of the roads and that the use of these tolls to repay federal loans for road improvement would not cause any increase whatever in present taxes. Therefore it should not be difficult to secure an amendment to the present law governing loans made by the Reconstruction Finance Corporation. When congress meets in December an amendment should be presented, providing that gasoline taxes for road improvement shall be regarded as highway tolls usable for paying interest upon federal loans and for amortization thereof.

Arguments in favor of such an amendment will be greatly strengthened by giving a list of states that have issued highway improvement bonds whose interest and amortization annuities are paid with gasoline taxes.

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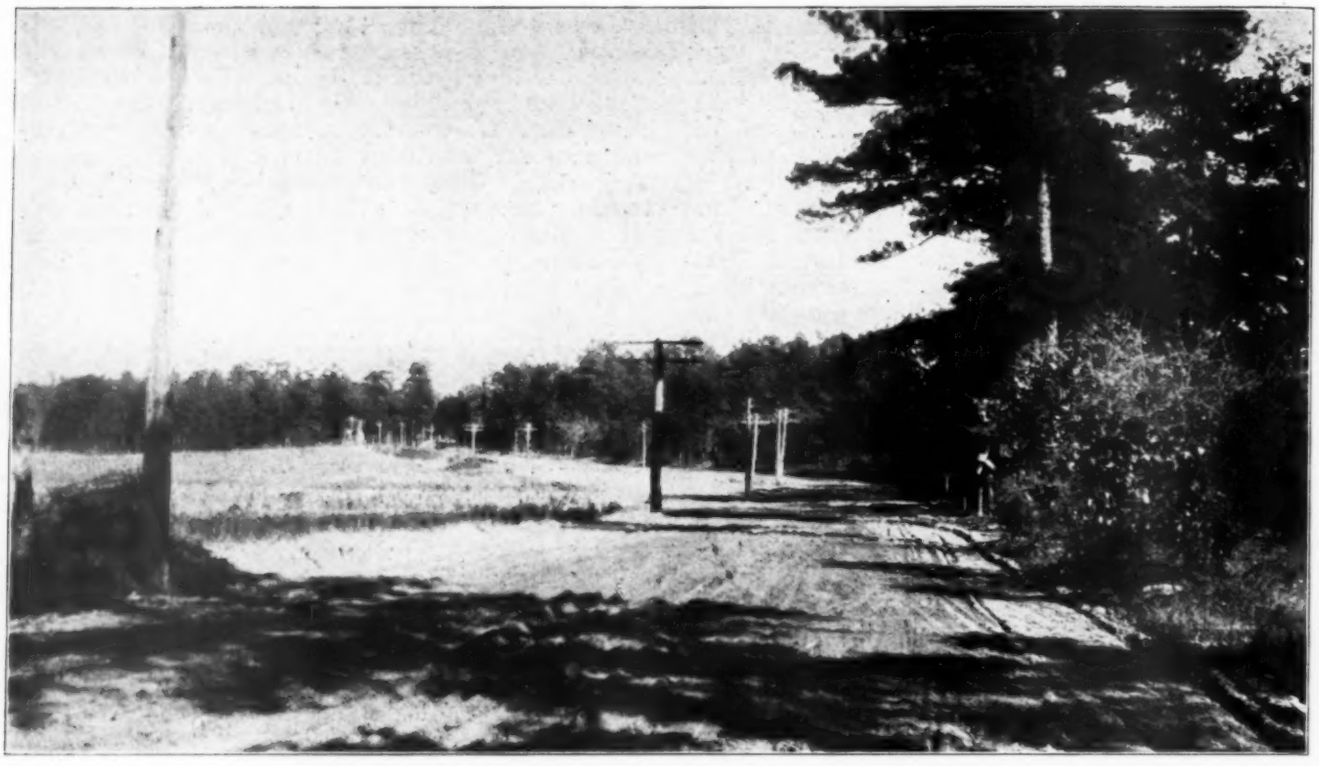
Clearing Snow

SNOW removal time is on us now. Already plows have been at work in parts of the United States. For the past two or three seasons the snowfall has been light. We are about due for a heavy snow winter and all agencies should look to the condition of their snow removal equipment and funds. Especially on low and intermediate type roads is this maintenance activity a necessary activity. Besides keeping the road open for traffic the surface is prevented from going to pieces.

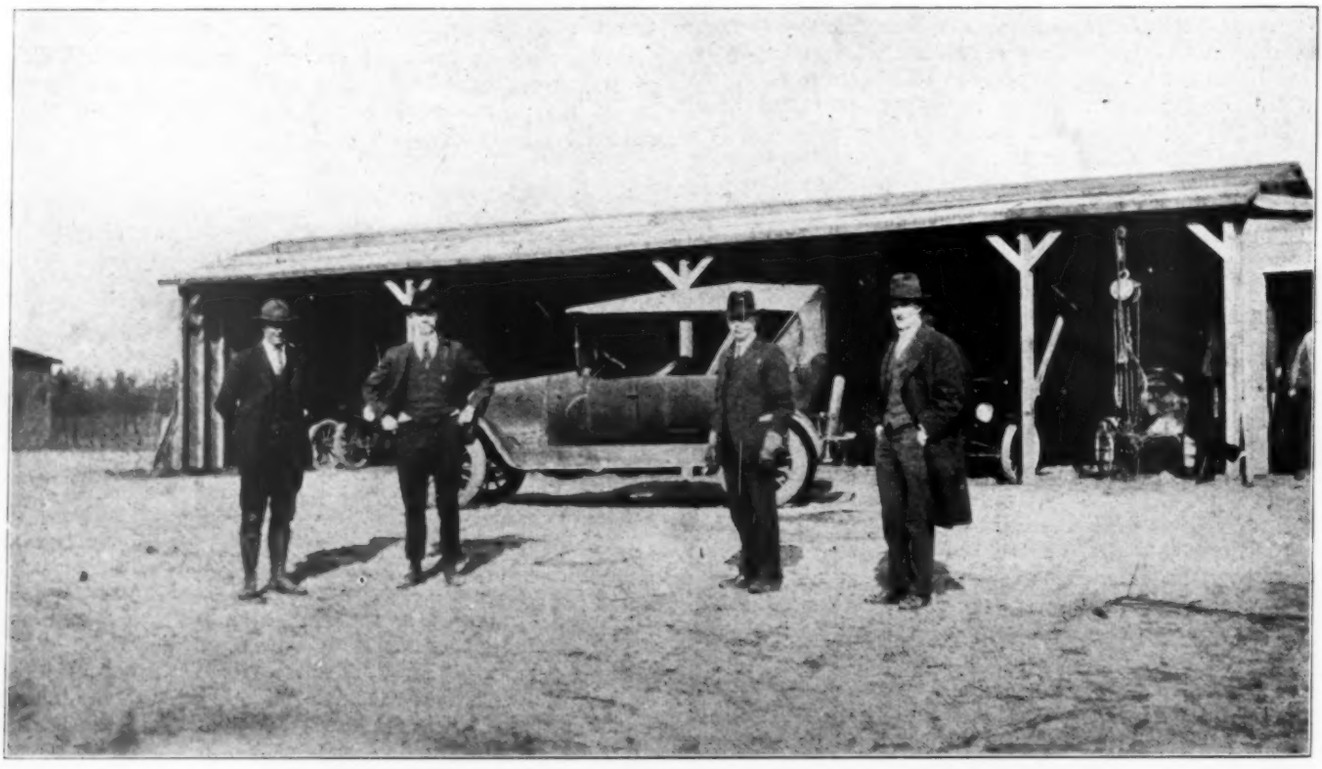
The two recent 3-in. snowfalls in the Buffalo region of New York State showed that maintenance forces there are prepared for what is to come. Manufacturers of snow fighting and removal equipment are tending last-minute rushes. This business could, with little planning, be cared for in advance of the season and thus spread the work over the year rather than rush the manufacturer just before the snowball hits us in the back.

H. P. Gillette

BEFORE



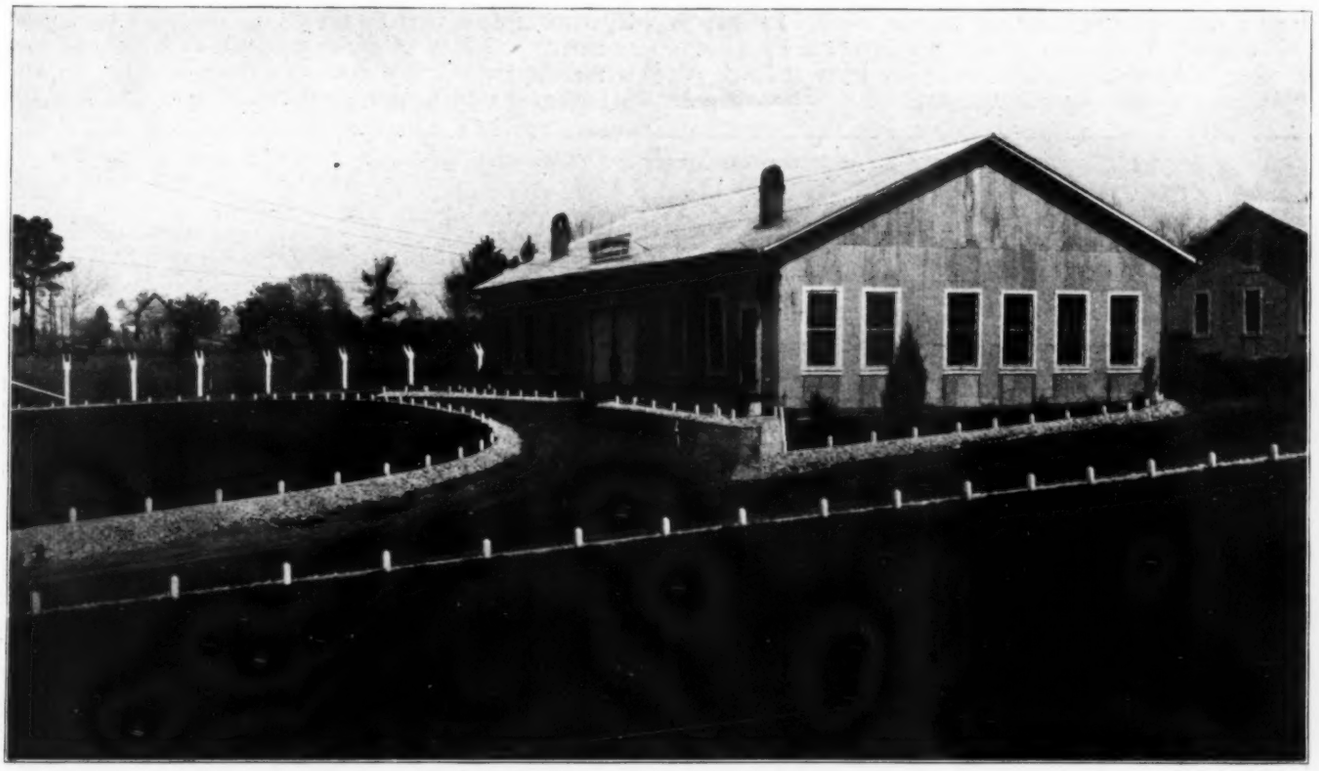
United States Highway No. 1 Near Columbia, S. C., in 1920—A Sand-Clay Road



South Carolina State Highway Department Equipment Repair Shop at Walterboro, S. C., in 1920

AFTER

United States Highway No. 1 near Columbia, S. C., in 1930, Now an 18 Ft. Asphaltic Concrete Surface



South Carolina State Highway Department Equipment Repair Shop at Walterboro, S. C., in 1931

County and Township Roads

County Organization for Construction and Maintenance of Secondary Road System

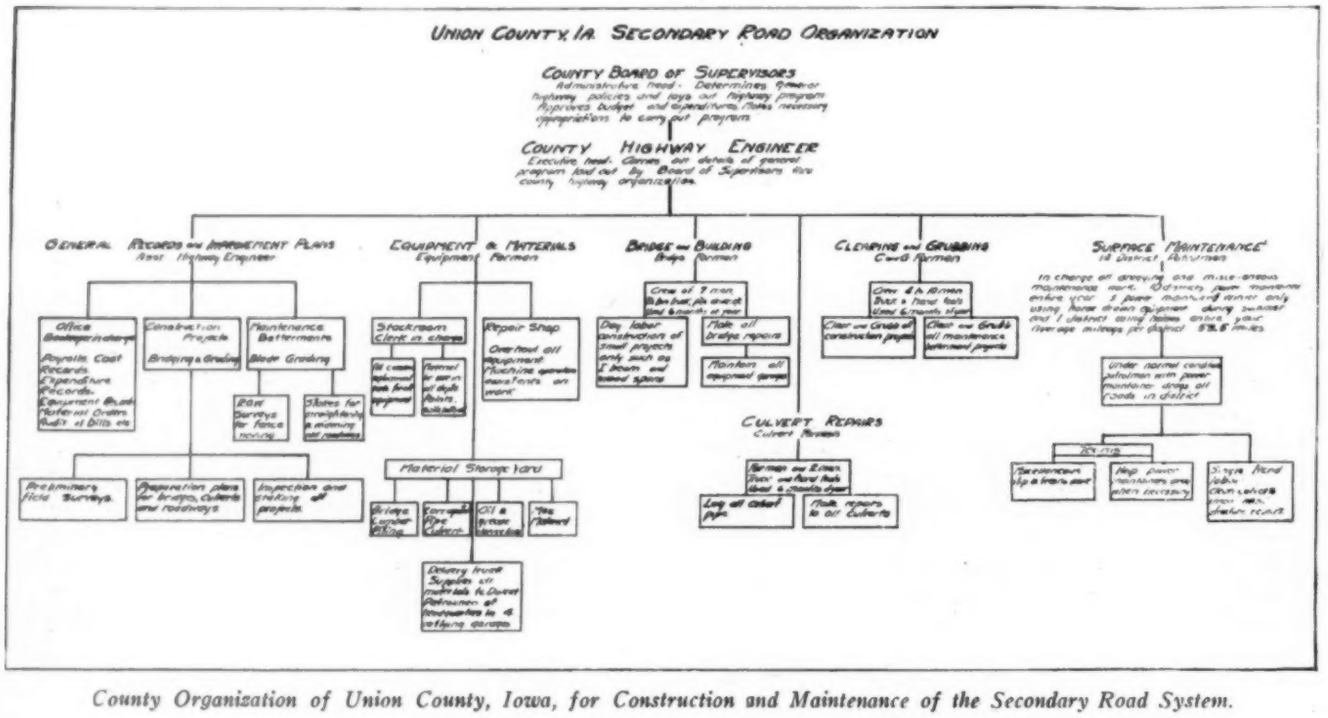
By ARTUHR K. OLSEN
County Engineer, Creston, Ia.

IN the construction and maintenance of Union County's secondary road system, which contains 750 miles of road, an organization has been developed to properly and effectively handle the work with the funds available. Any organization, of course, must be so organized that it can accomplish the work it has to do with the funds available. The organization must be so developed that the maximum service can be rendered to the public for every dollar expended. Union County's organization is of a necessity small because the funds for secondary road construction and maintenance are small, but, in order to offset this, a continual striving is made for added efficiency.

Scope of Work.—Highway work naturally covers a great deal of territory and for this reason it is very easy to fall into a system which has so many parts that it is impossible to properly control or supervise the individual workings of the organization. Especially is this true where many part time men are employed who do not have much interest in the organization and whose numbers complicate the handling of the work. In such a mushroom organization economy and efficiency of operation is obviously impossible. We have endeavored, therefore, to keep our organization as compact as possible, using modern equipment and full time men almost entirely. Of course, extra men are employed during the summer months for structure repair, clearing and grubbing, etc., but during the period they are employed they work every day. In this way efficiency can be attained.

Board of Supervisors.—First comes the board of supervisors, the elected representatives of the people who supervise all county affairs. Their duties with respect to roads comprise laying out the general program to be followed, levying the taxes to provide the necessary funds and determining the general policy to be followed: the law requires that carrying out these instructions of the board of supervisors shall be the duty of the county engineer.

Departmental Subdivision.—In order to quickly and effectively carry on the various phases of the work the organization must be divided into departments, each with a responsible head who is in turn responsible to the county engineer. By fixing the responsibility of each department we insure always getting the work one. Also by having one head of each epartment to whom the men in the department are responsible we avoid confusion and misunderstanding. In the same way the head of



County Organization of Union County, Iowa, for Construction and Maintenance of the Secondary Road System.

each department looks for instructions and is responsible to the county engineer. Finally the county engineer is responsible to and gets his instructions from the board of supervisors. By following this plan there is no overlapping of authority and consequently no misunderstanding and confusion. No man can successfully work for more than one boss, so by dividing up the organization in the way each man, no matter what his job, has but one man giving him instructions, which is the only way in which real efficiency can be attained.

Department of Accounts and Improvement Plans.—The organization is divided into six main departments, each under the supervision of one man directly responsible to the county engineer. First, is the main office under the direction of the assistant engineer. Here all cost records, payrolls, equipment records, inventories and everything pertaining to the entire organization are kept. Orders for machine parts and materials of any kind all come from here, making it the very heart and mainspring of the organization. Here, too, are prepared the plans for all construction work made up from the field data obtained by the assistant engineer in the field. The work in the office comprises both maintenance and construction for practically all records, invoices and payrolls are for maintenance since almost all construction work is done by contract and thus no records other than the plans, specifications and estimates to the contractor are required. Through the use of complete records on each type of maintenance we are enabled to trace exactly where every maintenance dollar goes. The complete records on equipment costs show us conclusively which types are giving the best results and enable us to determine places where savings can be effected. Reports to the operators showing just how much it is costing to operate their outfits in comparison with others of similar type tend to keep them on their toes trying to cut operating expense. This competition between men has saved many, many dollars the past few years. It also has enabled us to find the men who are efficiently taking care of their equipment and to replace those who are not.

In the same manner complete material records keep a careful check on everything used anywhere in the county, which tends to eliminate waste and unnecessary expenditure of any material. Similarly with bridge and culvert repair work as well as the expenditures of the district patrolmen, every expenditure is carefully recorded and by doing this over a period of years expenditures can be fairly balanced to cover the needs in all departments. No business could hope to operate successfully without adequate records and neither can a highway maintenance organization of any kind give the most service for every tax dollar expended unless the books show exactly how and where the money is being spent.

Equipment and Materials Department.—Next we have the equipment and materials department under the direction of an equipment foreman who is an experienced mechanic. This department takes care of all repairs to all equipment owned by the county. Their headquarters is a storage yard at Creston, the county seat, in which is situated a complete repair shop and storage garage. Connected with the shop is a storeroom which stocks all common replacement parts for all machines and all necessary tools, bolts and miscellaneous material used by all departments. In the yard is an oil house in which is stored one year's supply of oil and grease. In the yard is stored bridge lumber, culvert pipe, piling and all heavy materials required for any work in the county. Practically all materials other than machine parts are purchased but once a year at public lettings in order that the best possible prices may be had. This requires adequate storage space, but the advantage of the better prices obtained through quantity purchases and the convenience of always having on hand needed material offsets many times the cost of storage. With large stocks on hand it is necessary that they be carefully dispensed and for this reason a storeroom clerk keeps a record of everything which goes out and comes in and where it goes. From these data a perpetual inventory is kept at the office in order that the exact amount of all materials on hand may be known at all times. Through the use of the perpetual inventory supplies may be ordered before the stock is exhausted. Waiting for material always costs money and we save this by the use of the perpetual inventory which shows at a glance just what we have on hand.

Material Distribution.—A delivery truck is also at the disposal of the equipment foreman supplying material to the district patrolmen either on a particular job or to their headquarters in four outlying garages where are stored their machines and supplies. In this way it

The Main Yard and Shop at Creston

is possible to keep track of every bit of material and the records show exactly where it was used. We have eliminated waste and unnecessary use of material in this way.

Bridge and Building Department.—Next comes the bridge department which takes care of repairs to all bridges and builds new small wood bridges which can be constructed by them cheaper than they can be built by contract. All new construction of large spans, however, is built under contract. This crew generally operates about six months of the year, being one of three extra crews which do not work the entire year. The same men generally come back year after year, however, and by keeping the same foreman a very efficient organization can be effected. The crew usually consists of seven men, a 2½-ton truck, pile driver and complete bridge hand tools. The foreman keeps a complete job sheet showing all material and labor used on every structure. These data are turned into the office as a permanent record of the cost of maintenance of the particular structure.

Culvert Repair Department.—Taking care of miscellaneous culvert repairs and laying corrugated pipe culverts on the roads which are blade graded to standard width and alignment we have a pipe crew of three men including the foreman. They have a truck, trailer and necessary hand tools. They are another of the three extra crews working for a period of six months during

the year. The foreman here, too, keeps a job sheet on every job completed showing everything which was used including the labor.

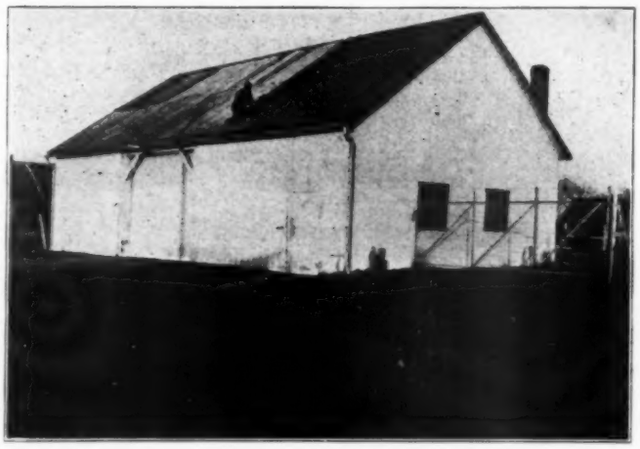
Clearing and Grubbing Department.—The third extra crew is the clearing and grubbing department. A foreman with from four to ten men clear and grub all brush and trees on all construction projects and maintenance betterment projects. We have found that we can do our clearing and grubbing cheaper by day labor than by contract and, therefore, even on contract construction work our crew does the clearing and grubbing.

Surface Maintenance Department.—Finally we have the surface maintenance department which takes care of the dragging on the 750 miles in the system and all miscellaneous work such as ditch and culvert cleaning and minor structure repairs. To handle this work efficiently the county is divided into 14 patrol districts with a patrolman in charge of each. On the average these districts consist of 53.5 miles of road, except one which contains but 11 miles. In the ten large districts the patrolman is equipped with a one-man power maintainer and under normal conditions drags all the roads himself. In the spring if conditions get so bad that it is impossible for him to get around on time he employs auxiliary teams with drags and 4-horse maintainers to assist him. In the other three large districts 60-H.P. tractors with 12-ft. blade graders are used six months of the year and 4-horse maintainers used during the summer months while the blade grader outfits are used for grading. In the small district horse-drawn maintenance is used for the entire year because of its inaccessibility and narrow roads.

All district patrolmen are budgeted at the rate of $100 per mile per year for trunk roads and $55 per mile per year for local or township roads. Since there are 120 miles of trunk and 630 miles of local roads in the system most of each patrolman's budget is at the rate of $55 per mile. This must cover all work done on their roads with the exception of major bridge repairing and maintenance betterments such as heavy blade grade work. Whenever team work or extra labor is necessary, the district patrolman employs the necessary help, carefully checking their time cards before being turned into the office. In this way the district patrolmen can control all expenditures within their respective districts so that the work can be kept within the budget limitations. It is also possible for the office to keep close check on all expenditures and the district patrolmen can be notified at frequent intervals regarding the status of their budgets.

Snow Removal.—For snow removal the 3 60-H.P. tractors with V-type plows are used. With these outfits all trunk roads and as many main local roads are opened as possible by running them continually night and day until the job is done, or until more snow necessitates their return to trunk roads again. Our budget will not allow the purchase of special snow fighting equipment such as trucks with plows. We, therefore, have to adapt, for snow removal, the equipment we use the year around. Tractor snowplows, while slow moving, nevertheless are very effective in clearing secondary roads. Of course, if we had sufficient funds we could use trucks on main well graded roads, leaving the tractors for the by-roads. This would be an ideal arrangement, but lacking the necessary funds we must do the best possible with what we have.

Part of Shop and Garage at Creston, Iowa



One of the Outlying Garages. This One Has Three Stalls for Housing Three Maintainers

Number of Men Employed.—During the winter, therefore, our organization consists of 20 men who work practically full time. There are times, of course, when no maintenance is required and during these spells the district patrolmen do not work, but this lost time is more than made up during periods of inclement weather when the machines are on the road long hours due to bad working conditions. Our men will, therefore, average 8 hours per day throughout the year and consequently we are able to keep our experienced organization from year to year, some of the operators having as much as 15 years' continuous service.

During the summer the use of the 3 extra crews brings our total man power to about 40 men. In addition 7 part time patrolmen with horse-drawn equipment are used to maintain the roads in the 3 districts where in winter are used the 3 60-H.P. tractors and 12-ft. graders.

Conclusion.—This system is serving our needs well and has been developed during the three years in which the board of supervisors has had jurisdiction over all secondary roads. It is the outgrowth of our experience with our local conditions and was developed to handle our work in the most efficient manner. Its centralization makes it readily responsive to instructions from the office and with each department held responsible for a particular job, orders are carried out promptly, once the man at the head receives them. No time is lost looking for someone to do a particular job, for there is a man on the job to take care of it. The success of any maintenance organization depends on the promptness with which a job can be done when a complaint is issued. When the public wants a job done they want it at once and an organization which cannot give immediate service will fail.

New Equipment and Materials

New FWD Tractor Truck

A new 72,000 lb. gross load tractor truck, designed to meet the requirements for a compact, heavy-duty transportation unit, is announced by the Four Wheel Drive Auto Co. of Clintonville, Wis.

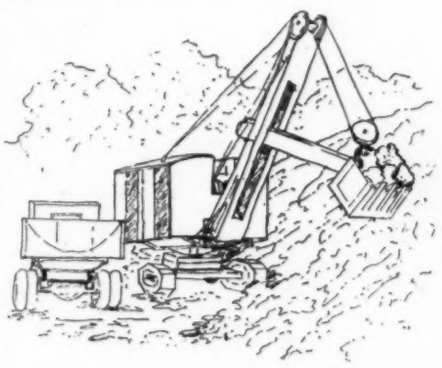
This unit meets the trend in highway regulation, which restricts the length and axle weight of tractor and trailer units. This ability to better comply with the highway regulations is due to the weight distribution on the tractor itself. The manufacturer states that one of the new tractor trucks in a typical installation carries a gross of 23,760 lbs., distributed 7,950 lbs. on the front axle and 15,810 lbs. on the rear axle.

This addition to the FWD line is a powerful unit, combining a very short overall length with equal weight distribution and four-wheel traction. The standard wheelbase is 120 ins., but in spite of this fact the propeller shafts operate at zero angularity.

New FWD Tractor Truck

Some of the other features stressed by the manufacturer are high average road speed, good acceleration, and economy of operation. With a gross load of 72,000 lbs., the tractor is stated to be able to maintain a road speed of 38 miles per hour on the level. The 125 hp. engine provides good acceleration and economy. It is equipped with down-draft carburetion and a further development of the original type of Ricardo head. The transmission is of the unit power plant type, providing four speeds forward and one in reverse. The power is transmitted through a transfer case to the front and rear propeller shafts by means of an 8-in. silent chain. The regular FWD positive lock center differential is used in this model, dividing the power between the two double reduction axles, which are equipped with 9.75-20 tires, singles front and duals rear. The frame height of 36 ins. is maintained by the use of a special drop type frame construction.

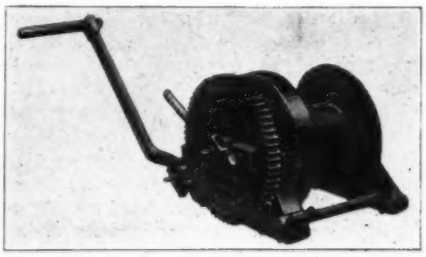
The safety factors in this new tractor truck are multifold, according to the FWD organization. Two separate and independent sets of four-wheel brakes are provided, with the service brake being operated by air.



New 3-Speed Hand Winch

A 3-speed hand winch with a capacity of 5 tons, has just been announced by the Union Machinery Company, Portland, Ore. Development of this winch was in process for one year before being offered to the trade.

The over-all dimensions are 16 ins. by 17½ ins. by 13½ ins. Weight is 150 lbs. Speeds and capacities are as follows: 25 to 1 ratio, capacity 10,000 lbs.; 4 to 1 ratio, capacity 1,500 lbs.; 1 to 1 ratio, for rewinding cable at greatest possible speed.



Ramsey 3-Speed Hand Winch

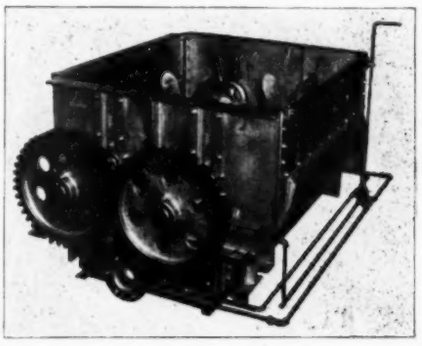
Speed change is simple and fool proof—no shifting of gears—merely change hand crank to positions provided.

In the final drive gears, the load is applied to three teeth on the pinion and three teeth on the drum gear. The drum holds 200 ft. of ⅝-in. cable. Spreading of frames under load is eliminated by use of thrust collars on the drum shaft.

40 Cu. Ft. (2-Ton) Iroquois Asphalt Pugmill Mixer

The Iroquois Works of the Barber Asphalt Co., 1800 Arch St., Philadelphia, Pa., recently introduced a new 40 cu. ft. (2 ton) asphalt pugmill mixer.

This mixer is of the pugmill type featuring a double slide and resulting larger opening which permits quicker discharge of material from the mixer. The slide gates are castings fitted with manganese steel liners and form the entire bottom of the mixer so that it presents a continuous regular surface wherein the gate forms only the actual central portion and slides under the main portion of the mixer bottom. This assures a clean bottom and prevents material from collecting at that point.



New Iroquois Asphalt Pug Mixer

One slide liner is longer than the other so that when the gates are closed the long liner extends partially over the other slide, abutting the shorter liner and thereby preventing leakage at the center which might be caused by asphalt adhering to the edges of the slides, thereby preventing them from closing. The bolt holes in the liners are equally spaced, thus permitting the liners to be interchanged and reversed in position. Since greater wear comes at the edge adjacent to the opening, this feature almost doubles the life of the slide liners.

Since part of the slide when opening passes out of the mixer, cast iron slide scrapers fastened to the end casting inside of the mixer are provided which sweep the slide clean.

Each slide moves on two series of three steel slide rollers, each equally spaced by means of roller train bars. The rollers moving on two steel rails supported under the mixer are well out of the way of the material being discharged. Special steel rail scrapers are provided which absolutely insures the rails being kept clean at all times.

The end castings are equipped with slots into which are fitted special cast iron gap plates which are fastened in place by four bolts each, thus facilitating removal. These plates are flanged over on the outside, thus preventing leakage of material at this point. Around each shaft on the inside of the mixer is placed a cast iron cheek plate. This plate is fastened to both the end casting and gap plates by means of flat head

bolts and is thus held in position. The inside face that is nearest the center of the mixer is chilled so that it presents a glass hard surface. Adjacent to this cheek plate another cast iron cheek plate is placed loose on the shaft so that it revolves with it. The outside face that is next to the stationary cheek plates is also chilled. These two faces being hardened and rubbing against each other as the shafts revolve makes a tight connection and prevents leakage without the necessity of having a packed joint.

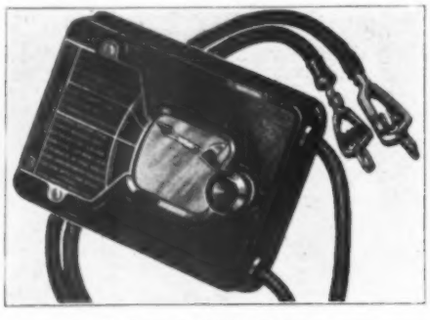
The mixer shaft bearings are mounted on structural steel members independent of the end castings, and are in turn mounted on the main frame carrying the mixer. This main frame is generally a portion of the mixer platform, thus the vertical component at each bearing is carried directly to the platform framing and not through the end castings, thereby permitting lighter sections to be used. This also permits various types of bearings to be used, and while babbitted bearings are regularly furnished, roller bearings can be readily substituted.

Split spacers made of cast iron are provided which facilitates removal from the shaft, it being unnecessary to remove the shafts to take off the spacers.

One of these mixers, bought by the Kolite Asphalt Roads, Inc., of Buffalo, N. Y., was set up at Portland, N. Y., to mix material used for resurfacing New York Route No. 20 between Fredonia, N. Y., and the Pennsylvania State Line. Its maximum capacity in mixing New York state type for cold mix which specifies a mixing time of 4 minutes per batch was 600 tons in one day of 22 hours.

Two New Testing Devices by United American Bosch

After several months of highly satisfactory field tests, the United American Bosch Corporation of Springfield, Mass., has just released two brand new ignition testers: The American Bosch Condens-o-scope and the American Bosch coil and cable tester.



Coil and Cable Tester

The outstanding importance claimed for those new developments in testing equipment lies in their extreme portability and simplicity and because units are tested under actual operating conditions without removal from the car.

The American Bosch Condens-o-scope is used for testing the condition of mica and wound paper condensers, for testing the leakage in electric wiring and for synchronizing ignition points. Tests may be made either on the bench or on the car with equal facility. All operations are performed easily, quickly and with assurance of accuracy. The entire unit is contained in an attractive and serviceable metal case, width 4 ins., height 5¾ ins., length 7½ ins. and weight only 3 lbs. The coil and cable tester provides a simple, convenient and effective means of determining the condition of ignition coils and cables. The test can be made in a few minutes right on the car where the actual operating conditions can be observed. The entire unit is contained in a black bakelite case and is very compact. Size 4 ins. wide by 5 ins. in length by 1¾ ins. high. Weight is slightly more than 1 lb.

New Paving Breaker

Announcement has been made by the Gardner-Denver Co., Quincy, Ill., of a new 70-lb paving breaker B-72.

Gardner-Denver B-72 Paving Breaker

This machine has the new Gardner-Denver tubular-type short-throw face contact valve. The air inlet is in the cylinder, not in the back-bead, and this feature, in combination with an air space between the handles and the head. keeps the handles cool.

Air consumption of the B-72 is so low that a Class 120 portable compressor is said to operate two of these 70-lb. breakers at highly effective working pressure.

A sheeting driver attachment with adjustable jaws; removable foot rests, and auxiliary holding handles is available. Only 1⅞-in. clearance is required for driving a second course of sheeting.

New Light Weight Model Electric Saw Announced

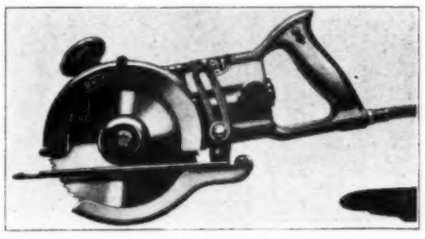
A new addition to their line of portable electric saws has been announced by Skilsaw, Inc., 3310 Elston Ave., Chicago, Ill. This Model "W" is the smallest of the Skilsaw family, measuring only 12 ins. over all, and is designed to meet the demand for a light weight saw that can be used on production work, while being equally suitable for maintenance and repair departments and for shipping rooms.

The new model is a sturdy, compact, inexpensive saw with all the stamina and craftsmanship of its bigger brothers. It is specially recommended for sawing 1 in. lumber, and will crossscut up to 2x12's in dressed lumber. Saw blade is 6 ins. in diameter, cuts to a depth of 1⅞ in. in wood. Saw base is vertically adjustable for depth of cut. An apron type approved safety guard automatically covers the revolving blade when saw is not in use.

Model "W' has a ⅓ hp. Universal motor for A. C. or D. C. current and operates on 110 volts. Because of its die cast aluminum frame, Skilsaw "W" is light—weighs only 8 lbs.—and is easy to handle. It can be picked up and used anywhere.

A switch of the monetary safety type is conveniently located at the handle and can be operated with the thumb. High-grade annular ball bearings are used in the construction of model "W."

Standard equipment consists of one combination rip and cut-off blade and 15 ft. of two conductor rubber covered cord with connectors for lamp or wall receptacle.



Model W Electric Saw

Bulk Cement Handling Equipment

A complete self-contained outfit for handling bulk cement from hopper or box cars to storage or batcher bins that is claimed to effect a considerable saving in unloading costs has been placed on the market by Sprout, Waldron & Co., Inc. This company is located at Muncy, Pa., and it also has offices at 75 West St., New York City.

The complete unit consists of a combination of horizontal and vertical screws of special design enclosed in electrically welded steel pipe. The entire unit can be easily moved from one job to another, as it is built in two sections—the feeder and the elevator. These are easily and quickly detached and can be loaded onto cars or truck without disturbing any working parts of the unit except drives.

The entire unit is so designed that it is dust tight. All joints are fitted with rubber gaskets that seal the unit against the entry of water. The bearings are antifriction and sealed against dust. The gears are cut steel and run in oil. Roller chain drives are used throughout. The drives are from one power source, which may be either gas engine or motor. It is stated that one man can easily operate the entire unit.

Vertical Screw Elevator Outfit

The Sprout Waldron vertical screw elevator is furnished complete with bin and

weigh checker or it can be installed with any standard make of cement bins now in service.

The Sprout, Waldron Co. also manufactures a batch checker and power shovel for unloading bulk cement from box cars. The batch checker consists essentially of a revolving drum suspended on a weighing mechanism. Cement is fed into the drum in the upright position and the drum is inverted to discharge batch. A rotary valve controls the flow of cement into the drum. A screw feeder serves to speed up the flow when valve is fully open and prevents arching in bin. When the valve is partially closed, the screw feed is automatically cut out—this reduces the flow so it may be cut off very accurately.

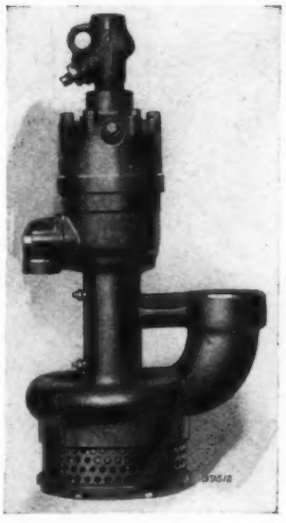
A two-beam scale is used—one beam for weighing batch and the other for checking the tare weight of empty hopper. The weighing beam actuates a power turning device which inverts drum to discharge batch. The turning device has no contact with the weighing drum during weighing and is engaged only while drum is actually turning. The only contact between the moving and stationary parts of the weighing device is through the scale pivots and levers. The device is so interlocked that only batches of correct weight—neither over or under more than tolerance allows may be discharged. The tare beam actuates the same turning device to return the drum to charging position after batch is discharged. Batches between 100 and 800 lbs. may be weighed and checked. It is stated that an 8-bag batch can be weighed in about 10 seconds, and that the discharging requires less time.

The power shovel consists of a two handle steel scoop attached to one end of a wire rope which leads over suitably arranged sheaves, and whose other end is attached to the drum of an automatic winch. The operator pulls the scoop to the desired position, plunges it into the material and slackens the rope. This automatically causes the weights to reverse the drum, trip the catch and throw the clutch into gear. Scoop is then drawn to point where it is desired to discharge load. The shovel comes complete with scoop, 35 ft. of wire rope, scoop chain and necessary sheaves. Shovel is usually mounted on bin structure and driven from power plant driving vertical screw or bucket elevator. Where desired it can be furnished with direct connected motor. The speed of drum shaft is 40 to 45 revolutions per minute.

New I-R Air-Operated Portable Sump Pump

A new portable, air-operated sump pump intended for use by mines, general contractors, public utility companies and other fields of service has been developed by Ingersoll-Rand Co., 11 Broadway, New York. It consists of an open-impeller type centrifugal pump driven by a "multi-vane" type air motor and both enclosed in a one-piece housing. The unit weighs 50 lbs., and is designated as sump pump size 25.

Typical uses are pumping from sumps, trenches, manholes, caissons, cofferdams, tanks, bilges, etc. The pump will handle clear or dirty water, oil sewage, or moderately heavy sludge. Materials used are suited to the services and include bronze, stainless steel and rust-proof steel for installations that require them.



Size 25 Portable Sump Pump

The pump is intended for lifts of 10 to 40 ft. with air pressure of 70 to 90 lbs., but will give satisfactory results under widely varying conditions of head and air pressure. Using air at 80 lbs. pressure, the capacity ranges from 170 g.p.m. with 10-ft. lift through 20 ft. of 2½-in. hose to 125 g.p.m. with 40-ft. lift through 50 ft. of 2½-in. hose. The pump is self-priming as it has no suction lift, and must be submerged to cover the inlet screen.

Sterling Enters Diesel-Powered Truck Field

Following announcements to their branch and dealer organizations of a complete range of 4- and 6-cylinder Diesel-powered heavy duty truck models, Sterling Motor Truck Co., Milwaukee, Wis., have launched a definite program of activity designed to cover the new and expanding field of Diesel truck operation in a very effective manner.

To date, thirteen Sterling models have been announced powered by Diesel, and the first regular production models are now under construction at the Sterling factory at Milwaukee. A number of the larger units are already sold and will go into immediate service.

The new Sterling Diesel-powered models range in capacity from 4 tons upwards and are designed for all types of heavy duty service from roadbuilding and excavation work to cross-country fast freight transportation. As a result of Sterling's extensive special chain drive patented features, they will be able to offer exclusive types of chain drive Diesel-powered Sterling models in addition to the conventional type of enclosed rear drive.

Sterling Diesel Powered Truck

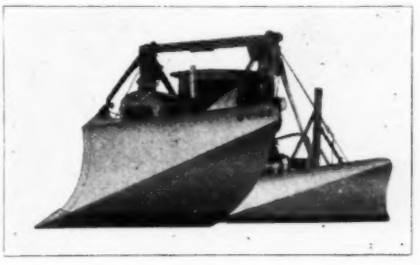
New Snow Plow

The LaPlant-Choate Mfg. Co., Inc., of Cedar Rapids, Ia., announces the completion of a new series of hydraulic operated snow plows for use on the "Caterpillar" 25-35-50-65 and Diesel tractors.

These plows include many new and improved features, among which is the newly designed wing hoist, which provides greater facilities for pushing out side banks of snow.

The wing is lifted simultaneously at three points—at the front of the wing—at the rear of the wing and at the point on the tractor where the wing braces are attached. In this way the chances of its folding up are stated to be entirely eliminated, as the wing brace tubes are perpendicular at all times.

The "V" nose and wings are raised and lowered by means of hydraulic pressure, obtained from the tractor power take-off. The control levers are placed within the cab convenient to the tractor operator's seat.



New La Plant-Choate Snow Plow

Surface Heater for Resurfacing Roads and Streets

A surface heater, the primary purpose of which is to blow a blast of hot air, without flame, on to an asphalt or other hard pavement, in order that an asphalt wearing surface may be securely bonded thereto, is illustrated below. This heater, in order to be made portable, is built in and on a framework complete, which may be set upon any desired truck.

The power is an internal combusion engine of sufficient horsepower to operate the

Greco Highway Surface Heater

entire equipment. The frame is rolled steel channels, gusset plates and hot riveted. The blower is a Sturtevant especially adapted to this machine

The burner is the mechanical atomization type, easily removed without special tools. Flame completely shielded and adjustable to combustion of oil from specific gravity 28 to 32° Baumé. The furnace is of carbofrax construction; in a combustion tube constructed in sections to facilitate replacements in cost of repairs. Constructed with inspection and lighting inlet. The special construction of this burner thoroughly preheats the air and keeps the combustion chamber within safe limits. For fuel all oil is strained to prevent clogging. Pressure is supplied by a rotary pump automatically attached. Tank capacity—250 gals.

The hood is 8 ft. by 8 ft. or 64 sq. ft. of heating surface. Suspended to allow finding its own level on unequal surfaces. Counter balanced with suitable springs. The conducting pipe is baffled and constructed of heat-resisting metals to prevent rapid oxidization.

The equipment, less motive power, weighs approximately 11,000 lbs. It is carried in a standard type 3-ton capacity truck, wheel base 170 in. minimum. Loading space, frame back of driver's seat, 120-in. minimum, equipped with open box seat, two side tire carriers, and extra set rear steel wheels (steel offset tires not less than 1 in. thick and 11 ins. wide). Alternatively, demountable rim wheels with both rubber and steel rim tires can be supplied.

The machine is known as the "Greco" highway surface heater. The Greco method of resurfacing is in successful use in New York, Chicago, Philadelphia, Pittsburgh and many other cities.

This surface heater is made by the Good Roads Equipment Corporation, 50 Church St., New York City.

New Milburn Paint Spray Gun

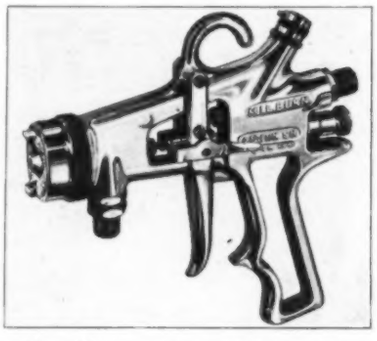
A paint spray gun with new exclusive features has been placed upon the market by The Alexander Milburn Co., Baltimore, Md. This spray gun is made in two sizes—Type M for large industrial and automotive work, and Type N for fine touch-up and high lighting.

The body of the gun is made of an improved aluminum alloy, having a tensile strength of over 60,000 lbs. per square inch. The passages for air or fluid are all straight drillings. The handle is part of the forged body of the gun. The Type M weighs approximately 1¼ lbs. and the Type N, ½ lb. The body of the gun forms a triangular frame which houses and protects the working parts from injury and the frame from distortion.

The fluid nozzle and air atomizer head are constructed on new principles. The air atomizer head has a seat in its base, into which the hardened steel nozzle seats both vertically and horizontally, giving rigidity and close alignment to the parts.

The atomizer head is formed in one piece and drilled so that the planes through which the air passages traverse are true parallel surfaces with the air orifices at right angles. The holes go straight through and have no cross drillings, thus permitting easy and instant cleaning. The external holes of the atomizer head are of special counter-sunk construction protecting the air currents from deflection and surfaces of the holes from injury.

The fluid, such as paint or lacquer, is controlled as to volume or density by means of an independent, removable unit needle valve made of stainless steel, adjacent to the operator's hand. Through the air valve control and the paint valve control, any width or shape spray or volume of material can be obtained. A special latch releases



New Milburn Type M Spray Gun

the paint control so that the spray can be cut off for safety while the operator is climbing ladders or scaffolds. It also allows the full air supply to be used for dusting.

The gun has large separate air passages for the central atomizing and flattening of air, all controlled by a single knob, the mere turn of which controls the initial air pressure and the air for both round or flat sprays. The paint volume is controlled from a fine mist up to the widest capacity of the spray. The spray gun is original in that it has means for controlling initial air pressure from its source without the necessity of an air regulator and equalizes erratic variations in the air compressor.

All parts of the guns are metal; the closing air valves are made of rustless steel ball seats. The threaded connections in the guns are so designed as to be interchangeable with any style or size connection desired without cumbersome adaptors.

The Type M and N spray guns can be furnished for siphon or pressure feed and with various nozzles for different materials, varying from the finest lacquer to emulsified asphalt.

Silverlink Roller Chain Announced by Link-Belt

The performance, efficiency and long life of finished-steel roller chain have constantly been bettered by the use of improved materials, improved machinery for making the parts within the close limits demanded, improved technic and more accurate control of the heat treatment, wider knowledge of chain action, and a better comprehension of proper sprocket wheel design.

And now comes an announcement by Link-Belt Co., Indianapolis, Ind., of a roller chain to be known by the trade-name, Link-Belt Silverlink. Although the chain is not made up with silver links, its side bars are especially treated to assist in resisting corrosion, and this treatment gives them the appearance of silver.

Silverlink roller chain is made in all sizes from ⅜ in. to 2½-in. pitch, and in single or multiple widths. It is available with wheels, for any horsepower, also with conveying attachment links in wide variety; and complete drives are carried in stock by distributors in sizes up to 225 hp., in speed ratios of 1 to 1 up to 8 to 1.

The construction features of Silverlink chain are enumerated as follows:

1. Sidebars of alloy rolled steel heat-treated for strength and toughness, and especially treated to resist corrosion, thereby prolonging the chain's life.
2. Nickel steel case-hardened pins, detachable type with cotter, or furnished riveted.
3. Solid steel case-hardened bushings.
4. Alloy steel heat-treated rollers. The Link-Belt curled roller is made from strip steel having a strong fibrous structure, with the fire running around instead of across the roller, so as to give the greatest strength and resilience to the roller (where the greatest wear takes place), and offer the maximum resistance to shock.
5. Uniformity and close clearances throughout, assuring accuracy of pitch and smooth chain operation.

New-Type Truck Seat of Live Sponge-Rubber

A newly designed truck seat of two-layer sponge rubber filler covered with a durable two-thickness sponge rubber filler covered with a durable two-thickness fabric slip cover is announced by the Sponge-Aire Seat Company, 1433 Main St., Buffalo, N. Y.

One of the advantages claimed for this sponge-rubber cushion is its ability to take the abuse of hard daily service without sagging, packing down or breaking out.

The Sponge-Aire cushion (slip cover model), because of its unusual combination construction is stated to absorb nearly 100 per cent of all vibration and shock.

Distributor News

Good Roads Sales Conference

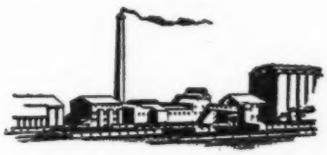
The Good Roads Machinery Corporation's of Kennett Square, Pa., recent sales conference was reported as a huge success. Starting off with a delightful luncheon at the Kennett Square Country Club, a number of dealers, distributors and salesmen heard inspiring talks and discussions by Messrs. McKaig, Harrington, Polk, Tucker and others. A dinner at the Wilmington Country Club, at which a number of guests were invited, followed by an informal get-together at the Du Pont Hotel in Wilmington, Del., added much to the success of the conference. The meeting was adjourned on Saturday noon, the morning having been given over to a continuance of the program started the day previous.

Following are those who attended the dinner at the Wilmington Country Club on Friday evening:

John Bowman, shop superintendent, Kennett Square, Pa.; Wm. M. Bryant, district representative, Fairmont, W. Va.; F. H. Conklin, Conklin & Harrington, New York City, exporters; W. R. Dunlap, Selden Hahn Company, Allentown, Pa.; Wm. Faison, president, Atlantic Steel Co.; Roy C. Whayne, dealer, Louisville, Ky.; H. G. Fassett, district representative, Meshoppen, Pa.; A. E. Finley, dealer, Raleigh, N. C.; L. K. Gordon, Allentown, Pa.; Chas. Grady, engineer, Good Roads Machinery Corp.; Albert Hahnan, dealer, Atlanta, Ga.; W. G. Harrington, president, Good Roads Machinery Corp.; Geo. M. White, engineer, Good Roads Machinery Corp. of New York; M. A. King, dealer, Chicago, Ill.; R. D. Kirkpatrick, dealer, Richmond, Va.; P. Z. Marton, district representative, Blue Ball, Pa.; Walter MacDowell, Kennett Square, Pa.; Tom Osborne, dealer, Knoxville, Tenn.; E. M. Schumo, vice-president, Pennsylvania Electric Steel Casting Co.; E. W. Systrom, dealer, Boston, Mass.; Geo. W. Thomas, third treasurer, Lukens Steel Co., Coatesville, Pa.; R. S. Tucker, Good Roads Machinery Corp.; W. D. Polk, Good Roads Machinery Corp.; F. B. McKaig, secretary and treasurer, Good Roads Machinery Corp.; W. F. Kuehneman, representative of Detroit financiers; L. E. Walker, district representative, Good Roads Machinery Corp., Colmar, Pa.; John C. Louis, dealer, president, John C. Louis Co., Baltimore, Md.; Geo. Schmidt, of John C. Louis Co.; J. M. Angell, Jr., ROADS AND STREETS, New York; E. H. Paull, Rock Products, New York.

Blaw-Knox to Manufacture and Sell Madsen Plants

The Blaw-Knox Co., Pittsburgh, Pa., announces an arrangement with the Madsen Iron Works, of Los Angeles, Calif., whereby the company will manufacture and sell complete plants of Madsen design and patents for pre-mixing asphaltic pavement material in territories in the United States east of the Rocky Mountains, and in countries outside of the United States of America.



These plants represent a highly developed line of machinery and equipment for preparing and mixing the materials for all types of asphalt, bituminous concrete oil-mixed and cold-laid pavements. It includes a complete line of mobile and portable plants and also stationary or tower plants for city and county paving. It is believed that this news will be welcomed by both engineers and contractors as it represents a centralization of manufacture through the Blaw-Knox Company of a very extensive line of equipment for constructing modern highways and streets.

Portland Cement Association Elects Officers

Cementmen gathered at the thirteenth anniversary meeting of the Portland Cement Association, held in Chicago last month, elected Charles F. Conn chairman of the board of directors. Mr. Conn, president of the Giant Portland Cement Co. of Philadelphia, has been a leader in the cement industry for many years.

H. L. Block, president of the Missouri Portland Cement Co. of St. Louis, was elected treasurer of the association and is also a director.

Other new directors are: Charles Boettcher, president, Oklahoma Portland Cement Co., Denver; G. S. Brown, president, Alpha Portland Cement Co., Easton, Pa.; C. B. Condon, secretary and general manager, Hawkeye Portland Cement Co., Des Moines; Charles Horner, president, Kosmos Portland Cement Co., Louisville; J. B. John, president, Medusa Portland Cement Co., Cleveland; M. C. Monday, president, Hermitage Portland Cement Co., Knoxville; J. J. Porter, president, North American Cement Corporation, New York; and J. S. Young, president, Lehigh Portland Cement Co., Allentown, Pa.

Hold-over directors are: B. F. Affleck, president, Universal Atlas Cement Co., Chicago; George F. Coffin, secretary and treasurer, Nazareth Cement Co., Easton, Pa.; Charles L. Hogan, vice-president, International Cement Corporation, New York; J. D. Johnson, president, Canada Cement Co., Ltd., Montreal; Morris Kind, president, Hercules Cement Corporation, Philadelphia; E. P. Lucas, president, Superior Portland Cement, Inc., Seattle; Blaine S. Smith, president, Pennsylvania-Dixie Cement Corporation, New York; L. T. Sunderland, president, Ash Grove Lime and Portland Cement Co., Kansas City; John Treanor, president, Riverside Cement Co., Los Angeles; C. E. Ulrickson, vice-president, Trinity Portland Cement Co., Dallas; E. J. Mehren, president, Portland Cement Association, and Wm. M. Kinney, vice-president and secretary of the association.

The thirtieth anniversary of the association was commemorated at a special dinner at which Robert W. Lesley, a founder of the association and its first president, was a guest of honor.

Because of its organization in 1902, the Portland Cement Association ranks as one of the oldest trade associations in the country.

The association was formed to consider what is now a minor incident in the manufacture of cement, the sacking problem. At the time of the association's birth, the use of cement was largely confined to rough structures, such as dams and foundations. But through co-operation the cement manufacturers standardized principles of use, so now cement is utilized in nearly all structures, either as a structural or decorative material and oftentimes both.

Wennerlyn on "Caterpillar" Dealer Advertising

George E. Wennerlyn, who has served the Caterpillar Tractor Co. and its predecessor, the Russell Grader Mfg. Co., for 20 years, has moved from Minneapolis to become assistant advertising manager at Peoria. Mr. Wennerlyn's chief responsibilities will be in the utilization of advertising material, including dealer and district representative contacts and supervision of dealers' local display advertising and direct mail programs. Mr. Wennerlyn is one of the real pioneers in the good roads advertising field. His record includes 8 years with Dallenmayer Advertising Agency at Minneapolis, 16 years with Russell Grader Mfg. Co., Minneapolis, in sales and advertising, and 4 years with the Caterpillar Tractor Co. as assistant manager of the Minneapolis plant.

Wagner Appointed General Sales Manager for National Equipment Corp.

The National Equipment Corporation, Milwaukee, Wis., have announced the appointment of Carl S. Wagner as their general sales manager.

After graduating from the University of Michigan in 1907, Mr. Wagner entered the employ of the American Locomotive Co., where he served successively as shop apprentice, estimator and later as the company's sales representative in various foreign fields. In 1916 he became associated with the Insley Manufacturing Co. and since that time has been actively connected with the construction equipment industry. He brings to the Koehring, Smith, Parsons and Kwik-Mix Divisions of the National Equipment Corporation an appreciation of construction problems which should be of value to the industry in which N. E. C. is a leading producer.

FWD Adopts Five-Day Week in Rehabilitation Move

The Four Wheel Drive Auto Co. of Clintonville, Wis., has recently adopted the five-day week to aid in the National Rehabilitation Program. The plan was put in effect on Nov. 1, and takes in all departments of the company, except the sales and service departments.

"In adopting this new plan, we are able to give an additional man work for every ten men now on our force," stated Walter A. Olen, president and general manager of the FWD company and a director in the National Rehabilitation Program. "Our manufacturing department, while not running to capacity, has shown an increase over the past few months, and the forty, instead of forty-four-hour week, will allow us to reduce the unemployment situation materially in our territory. Men of our organization, who have been temporarily without work, are, of course, being given preference."

New Representatives for Rex-Watson

S. E. Ackerman, general sales manager of the Rex-Watson Corporation of Canastota, N. Y., makers of the Watson "Tractor Hitch" trailers, announces the appointment of Clayton S. Carris, of Savannah, N. Y., as western New York representative. Mr. Carris has an automotive experience dating back to 1903. During the past eleven years, Mr. Carris has served the White Company as branch manager, and the Stewart Motor Corporation as district sales manager.

Frank B. Harris, of the Yacht Sales and Service, Inc., 401 N. Broad St., Philadelphia, Pa., has been appointed representative for the Rex-Watson Corporation. Mr. Harris has had a broad and successful experience in both automotive and boat merchandising lines for several years past. His territory besides eastern Pennsylvania will comprise southern Jersey, Delaware, Maryland and the District of Columbia.

New Distributors for Marmon-Herrington

The appointment of two new distributors in important western territories is announced by Bert Dingley, vice-president in charge of sales of the Marmon-Herrington Co., Inc., Indianapolis. The first of these distributors is the Associated Eqipment Co., Ltd., San Francisco, Calif., which will handle the sale of Marmon-Herrington trucks in the wide territory comprising northern California and the entire state of Nevada. Well-known in truck and equipment circles this company is headed by J. H. Heil, president; William C. Gunther, secretary, and W. H. Worden, director of sales. The headquarters of the company are at 355 Freemont St., San Francisco. The R. L. Harrison Co., Inc., has been appointed Marmon-Herrington distributor for the state of New Mexico. R. L. Harrison is president of this company which is situated in Albuquerque, N. M.

SKF Drill Steel Now Sold by Ingersoll-Rand

Arrangements have been made whereby Ingersoll-Rand Co., 11 Broadway, New York, has acquired exclusive rights to market SKF drill steel throughout the world. The product is being sold under the trade name IR-SKF.

This brand of steel, which is claimed to be of unusually high quality, was developed as a result of exhaustive tests and experiments by the technical departments of Ingersoll-Rand Co., in collaboration with the SKF mills.

Link-Belt Appoints New Sales Manager

Announcement is made that Link-Belt Co. has recently appointed George M. Sharer sales manager of its eastern division, with headquarters in Philadelphia. In this capacity, he has direct supervision of sales of all of the company's offices in the Atlantic coast states. Mr. Sharer is a mechanical engineer of broad experience, and has been connected with Link-Belt in Philadelphia in various capacities for the past 32 years.

Eller Organizes Equipment Sales Co.

K. C. Eller, Columbia, S. C., recently organized the Equipment Sales & Supply Co., Inc., with $26,000 paid in capital and surplus, for the purpose of selling and distributing county, municipal, contractors and industrial equipment, supplies and building specialties in Virginia, Carolinas and Georgia. Mr. Eller has long been identified with the equipment and supply business, in the southeastern states, in the capacity of sales manager, General Utilities Co., Norfolk, Va., district sales manager, Northwest Engineering Co., Chicago, Ill., and direct representative Thew Shovel Co., Lorain, O. In organizing the Equipment Sales & Supply Co., Mr. Eller has associated with him men of long experience in the equipment, construction and supply fields.

Warren Tool Corporation Organized

Announcement has been made within the last few days that the Warren Tool Corporation of Warren, O., recently organized by the bondholders' committee of The Warren Tool & Forge Co., will continue the forged steel hand tool business and the malleable iron foundry which the old company has operated since 1912.

Warren Tool Corporation will concentrate its manufacturing and sales activities on the 150 styles and types of forged steel hand tools, and also on the "Devil" line of railroad track tools made from special alloy steels.

C. L. Schoonover, whose successful operation of the business as agent for the bondholders' committee is a matter of note, will be president and general manager. Howard C. Mull, widely known throughout railway supply and jobber channels, will be vice-president in charge of sales. R. E. Gibson will be treasurer, and Thorn Pendleton secretary of the new company.

Lincoln Electric Appoints New District Manager

Appointment of Fred C. Archer as manager of the Philadelphia district is announced by The Lincoln Electric Co., Cleveland, O. Previous to his joining the Lincoln staff, Archer was president of The Fred C. Archer Co., which he organized in 1925. Before going into business for himself, he was employed by the Kelly-Springfield Co. and the White Motor Co. The Philadelphia office of The Lincoln Electric Co., located at 401 N. Broad St., maintains a sales and service organization for all Lincoln products including "Shield Arc" welders, welding supplies and "Linc-Weld" motors.

Benet Now Manager Worthington's Harrison Works

The Worthington Pump and Machinery Corporation recently announced the appointment of Hugh Benet as manager of its Harrison, N. J., works. Since 1927, when Mr. Benet became associated with the Worthington organization, he has served as manager of the corporation's Holyoke, Mass., works.

Gardner-Denver New Agent in Roanoke, Va.

The Gardner-Denver Company, Quincy, Ill., announces the appointment of the Southern Machinery & Supply Co., Roanoke, Va., as agent for its complete line of rock drills and accessories, portable and stationary air compressors, steam and power pumps.

Engels Tractor Co. to Represent O. K. Clutch

The Engels Tractor Co., Inc., 234 North Genesee St., Utica, N. Y., will represent the O. K. Clutch and Machinery Co., exclusively in that territory and will carry its line of hoists and compressors in stock.

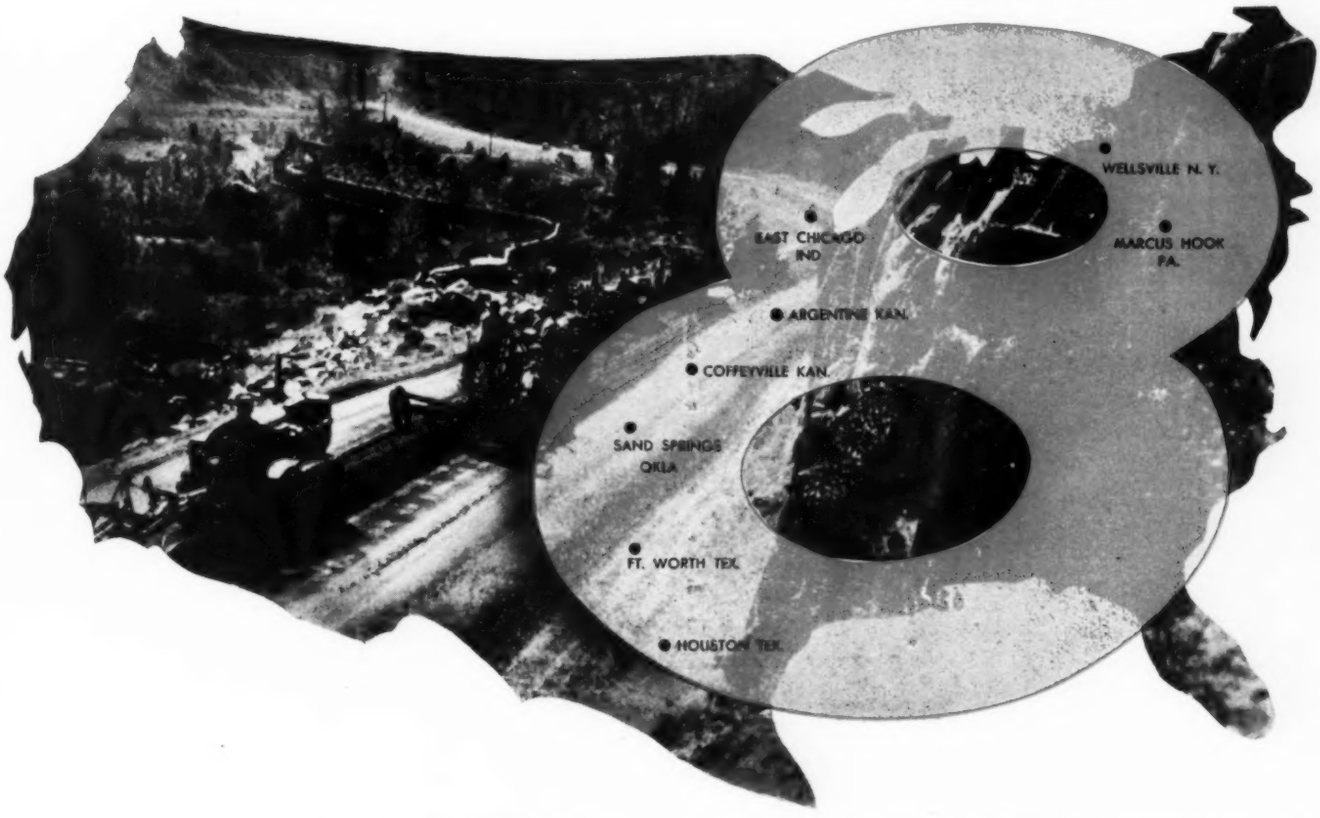
Westinghouse Elects Two Vice Presidents

Following the meeting of the board of directors of the Westinghouse Electric & Manufacturing Co., held in New York, President F. A. Merrick announced the election of two vice-presidents.

C. E. Stephens, formerly commercial vice-president, with headquarters in New York, was elected vice-president. He will remain in New York.

N. G. Symonds, formerly commercial vice-president at Chicago was elected vice-president in charge of sales. His headquarters will be at the general offices of the company in East Pittsburgh. According to the announcement he will report directly to J. S. Tritle, vice-president and general manager.

The world's largest pipe line system serves the SINCLAIR BIG



7,000 miles of pipe line (the world's largest pipe line system) bring to the 8 great Sinclair refineries the high quality crudes from which some 200 different Sinclair products are manufactured.

The low cost of these products in actual use is shown by the fact that Sinclair, for the second successive year, has been awarded the major part of the U. S. Navy lubricating contract. In considering competitive bids on this contract, the Government took into account both quality and price. *Sinclair products were chosen because they showed the lowest service cost per gallon.*

In the contracting field the soundness of Sinclair lubricating advice is everywhere recognized. Sinclair lubricants are preferred by many important road building and other contracting firms.

Our engineering service is at your command. Sinclair engineers are daily consulting with important oil users, assisting them to solve knotty lubricating problems. Call or write our nearest office or any local Sinclair Agency. Sinclair Refining Company (Inc.), New York, Atlanta, Chicago, Houston, Fort Worth, Kansas City. Sinclair Refining Company of California, Los Angeles.

Tune in Monday evenings . 36 NBC Stations — SINCLAIR MINSTRELS

SINCLAIR

INDUSTRIAL OILS MOTOR OILS TRACTOR OILS GREASES

Cletrac

NOW THE NEW IMPROVED CLETRAC 80 $4650

F. O. B. FACTORY

Complete with Electric Starting Equipment, Radiator Guard, Crankcase Guard and Front Pull Hook as illustrated

83 Horsepower at the Draw-bar

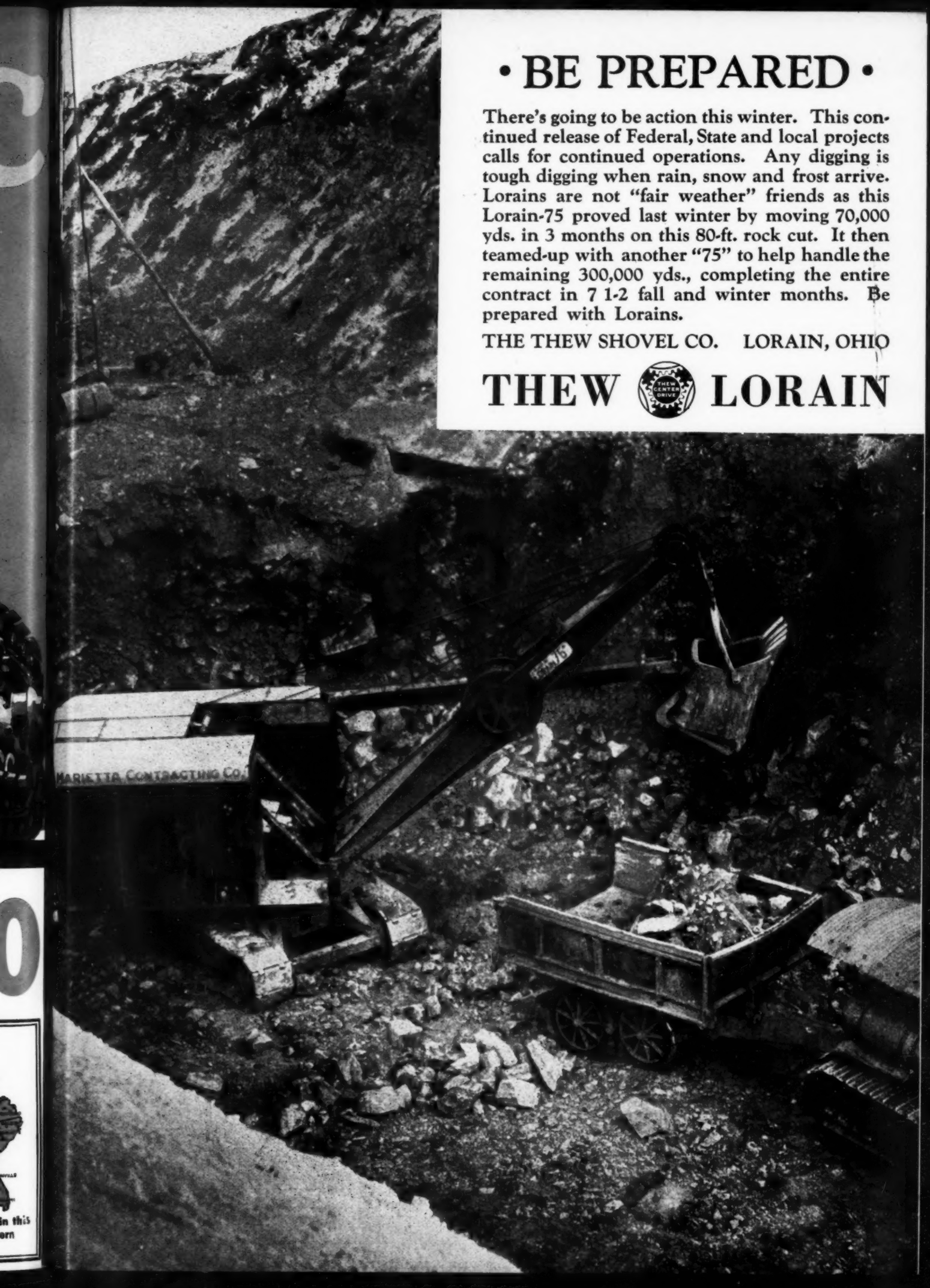
(New price equals 24½¢ per draw-bar pound pull)

THE CLEVELAND TRACTOR COMPANY

Cleveland, Ohio, U. S. A.

SEE THE CLETRAC 80 AT THE ROAD SHOW . . . DETROIT AIRPORT . . . JAN. 16—20

Cletracs are sold and serviced in this territory by The Austin-Western Road Machinery Co.



• BE PREPARED •

There's going to be action this winter. This continued release of Federal, State and local projects calls for continued operations. Any digging is tough digging when rain, snow and frost arrive. Lorains are not "fair weather" friends as this Lorain-75 proved last winter by moving 70,000 yds. in 3 months on this 80-ft. rock cut. It then teamed-up with another "75" to help handle the remaining 300,000 yds., completing the entire contract in 7 1-2 fall and winter months. Be prepared with Lorains.

THE THEW SHOVEL CO. LORAIN, OHIO

THEW THEW CENTER DRIVE **LORAIN**

ROADS AND STREETS

C. T. MURRAY
Managing Editor
V. J. BROWN
C. N. CONNER
D. G. LEDGERWOOD
Make-up Editor

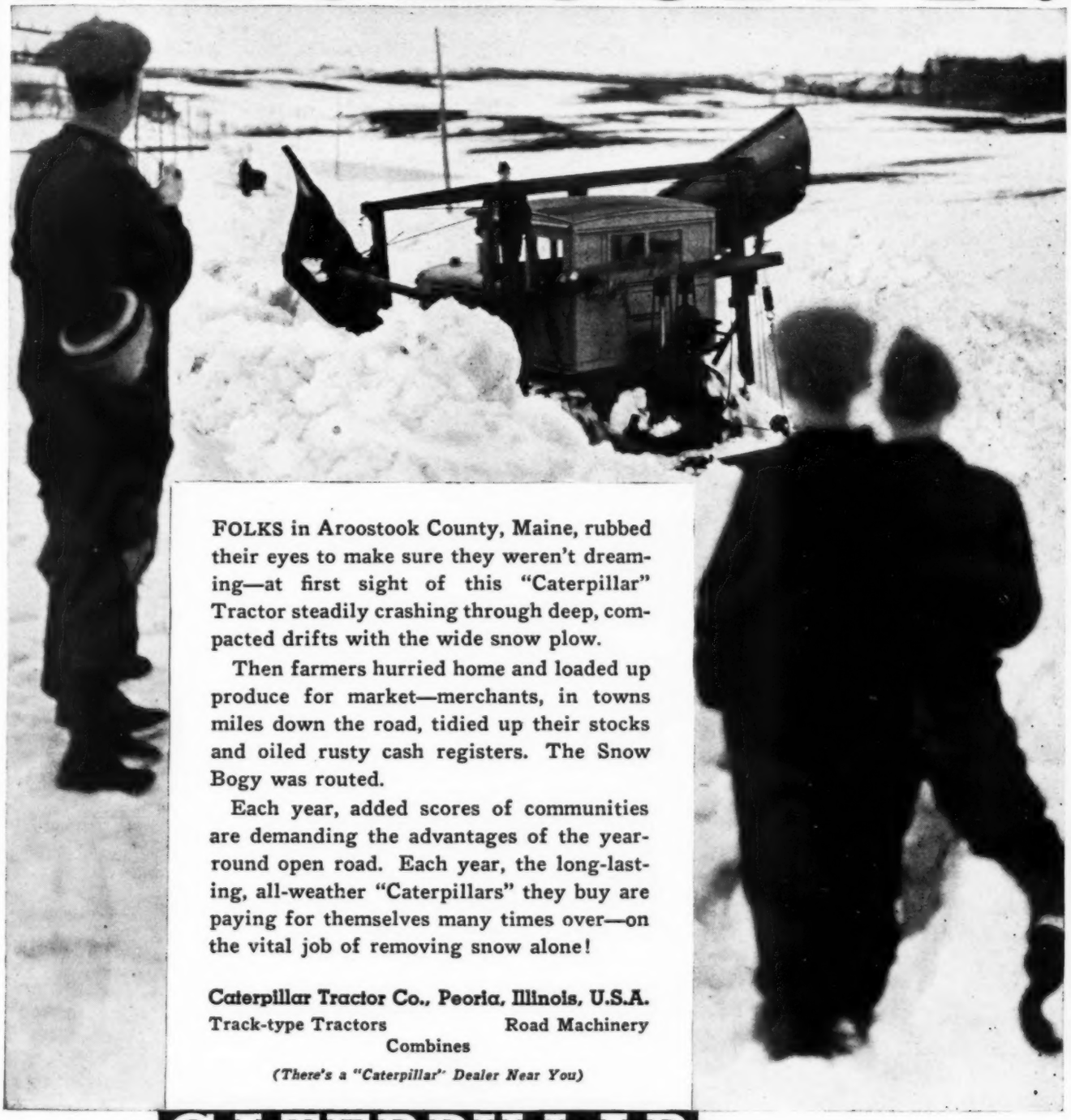
Design, Construction, Maintenance and Traffic Control
H. P. GILLETTE, *Editor*

Established 1906
VOL. LXXV, No. 12

Advertisers In This Issue

CONTENTS for DECEMBER, 1932

First seen—a marvel...then a NECESSITY!



FOLKS in Aroostook County, Maine, rubbed their eyes to make sure they weren't dreaming—at first sight of this "Caterpillar" Tractor steadily crashing through deep, compacted drifts with the wide snow plow.

Then farmers hurried home and loaded up produce for market—merchants, in towns miles down the road, tidied up their stocks and oiled rusty cash registers. The Snow Bogy was routed.

Each year, added scores of communities are demanding the advantages of the year-round open road. Each year, the long-lasting, all-weather "Caterpillars" they buy are paying for themselves many times over—on the vital job of removing snow alone!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Track-type Tractors Road Machinery
Combines

(There's a "Caterpillar" Dealer Near You)

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

Prices — f. o. b. Peoria, Illinois

FIFTEEN . .	$1100	THIRTY-FIVE	$2400
TWENTY . .	$1450	FIFTY . . .	$3675
TWENTY-FIVE . . .	$1900	SIXTY-FIVE	$3850
		DIESEL . .	$6500

Here's the answer to your

FILL SETTLEMENT DATA

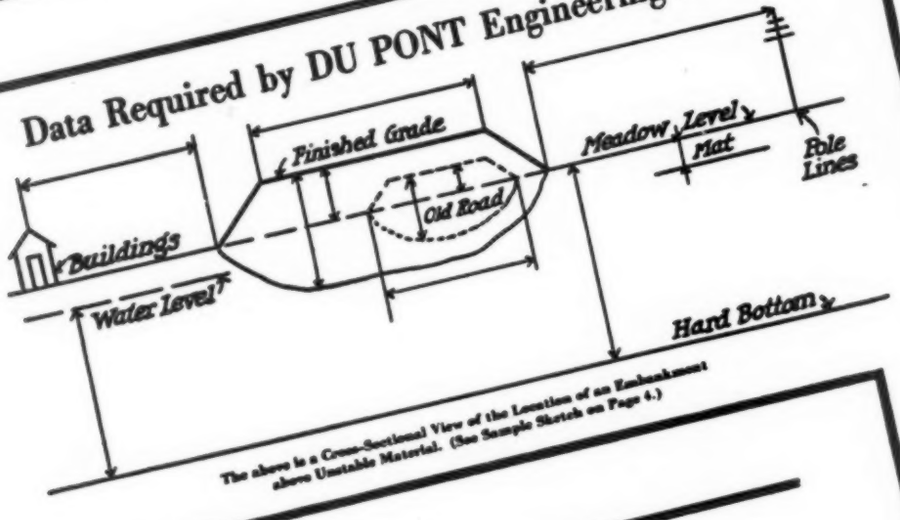
To enable our explosive engineers to prepare and submit a practical plan showing the location, quantity and kind of explosives required to solve your Fill Settlement problem, please give us a detailed description of the project. On the inside of this form are diagrams indicative of data required. Also questions to be answered to aid in the preparation of the plan applicable to your project.

LOCATION OF PROJECT

STATE.....COUNTY.....PLACE.....

HIGHWAY NO. FEDERAL ☐, STATE ☐ OR COUNTY ☐ (Please indicate which.)

Data Required by DU PONT Engineering Staff



The above is a Cross-Sectional View of the Location of an Embankment above Unstable Material. (See Sample Sketch on Page 4.)

RECOMMENDATIONS

In accordance with data stated on the preceding pages of this form, and after a careful study of the conditions as presented, we submit the following recommendations for the use of du Pont Explosives to displace the unstable material beneath embankments located on

Highway No.....in..... State of.....and identified as Project No.....

Fill Settlement problem

Write out a description of your Fill Settlement project in du Pont's new "FILL SETTLEMENT DATA" folder. Du Pont Explosive Engineers tell you what blasting method to use—and the quantity and kind of explosives to use

DU PONT OFFERS a new service to highway engineers, contractors, road builders! If you have a Fill Settlement project and want more information on the most satisfactory way to use dynamite for it—simply write to du Pont for a "FILL SETTLEMENT DATA" folder.

This "DATA" folder—the first of its kind ever to appear—has been developed especially for your benefit. Du Pont will gladly supply you with one or more folders.

When you receive your folder, you write in a description of your project; fill out, on a cross-sectional drawing, the distances and depths; answer questions relating to the project; and furnish profiles of bottom of fill, and hard bottom.

CIRCLE—Ditches blasted at the toe of the fill slope relieve natural side pressure, and break up any bridging effect between the fill and the mat surface of the swamp.

With this information, du Pont Explosive Engineers can give you accurate recommendations. Du Pont engineers have studied every phase of Fill Settlement work over a number of years. They have developed three different methods of blasting which singly, or in combination, will fit any Fill Settlement project in any section of the country. They will tell you the method that will fit *your* project.

If you want to cut down maintenance costs—if you want to use dynamite to remove the unstable material below highway embankments in the most efficient manner — write to du Pont TODAY for your "FILL SETTLEMENT DATA" folder.

Then—fill it out—and return to du Pont.

SQUARE—Dynamite for the underfill charges were loaded in three lines of holes through second-hand pipe driven to the proper depth. These loads were in place before the ditch shots were made, and were fired immediately following the above shot.

DU PONT
REG. U. S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, Inc.

Explosives Department . . . Wilmington, Delaware

Mr. Highway Official- this might be your CHILD

ICE CONTROL with CALCIUM CHLORIDE SAVES LIVES

KEEPING icy streets safe for pedestrians and motorists is a severe job. Cinders and sand are not enough. They brush away easily when ice is smooth and hard. They need replacing constantly. They are not adequate.

Mix Calcium Chloride into your ice control abrasives. It immediately anchors gritty materials into the ice, even in coldest weather. Icy roads are made safe to travel upon.

Stock piles can be prepared at proper locations by mixing alternate layers of Calcium Chloride and grits. If no such piles are available, the material can be prepared on the load either with flake Calcium Chloride or its solution.

Be ready! Be safe! Save lives by using this proven, quick, dependable method to make icy streets safe.

Write for complete data on the use of Calcium Chloride for ice control.

CALCIUM CHLORIDE ASSOCIATION

THE DOW CHEMICAL COMPANY	Midland, Michigan
THE COLUMBIA ALKALI CORPORATION	Barberton, Ohio
SOLVAY SALES CORPORATION	61 Broadway, New York City
MICHIGAN ALKALI COMPANY	10 East 40th St., New York City

CALCIUM CHLORIDE
FOR ICE CONTROL

REDUCE THE COST OF CONCRETE

. . . by simplifying Mixing Plant Design and Operation

A portable Fuller-Kinyon pump unloads cars and transports cement to either compartment of the mixer bin, through the pipe-line, indicated by the arrows.

One of the features of the Fuller-Kinyon System for handling bulk cement, which sets it apart from all other conveyors, is the general freedom in plant lay-out which it offers the Engineer. If it is realized that this system is more than an improvement over mechanical conveyors of cement, very tangible savings may be made in the initial cost of the plant, as well as in its operation. By eliminating straight line and short distance conveying, the more difficult problems of unloading, storing and handling aggregates are easily solved. The most favorable delivery or trucking of concrete can be adopted by avoiding confusion with bulky conveyors or cement cars adjacent to the plant.

Applications of these advantages are indicated in the plant illustrated at the left. Aggregates are handled over the shortest distances, and the plant yard left free for the movement of trucks.

These systems are now handling bulk cement on an impressive number of current construction projects, as well as in permanent mixing plants. We have just published a bulletin illustrating a wide variety of temporary and permanent installations, particularly with reference to unusual local conditions. We believe that the design features of these plants will be of interest to all Engineers interested in construction, to suggest various expedients applicable to their present or future needs. This bulletin further discusses other economies of this conveyor in contrast to mechanical systems and explains the operation of the pump.

No other Conveyor:

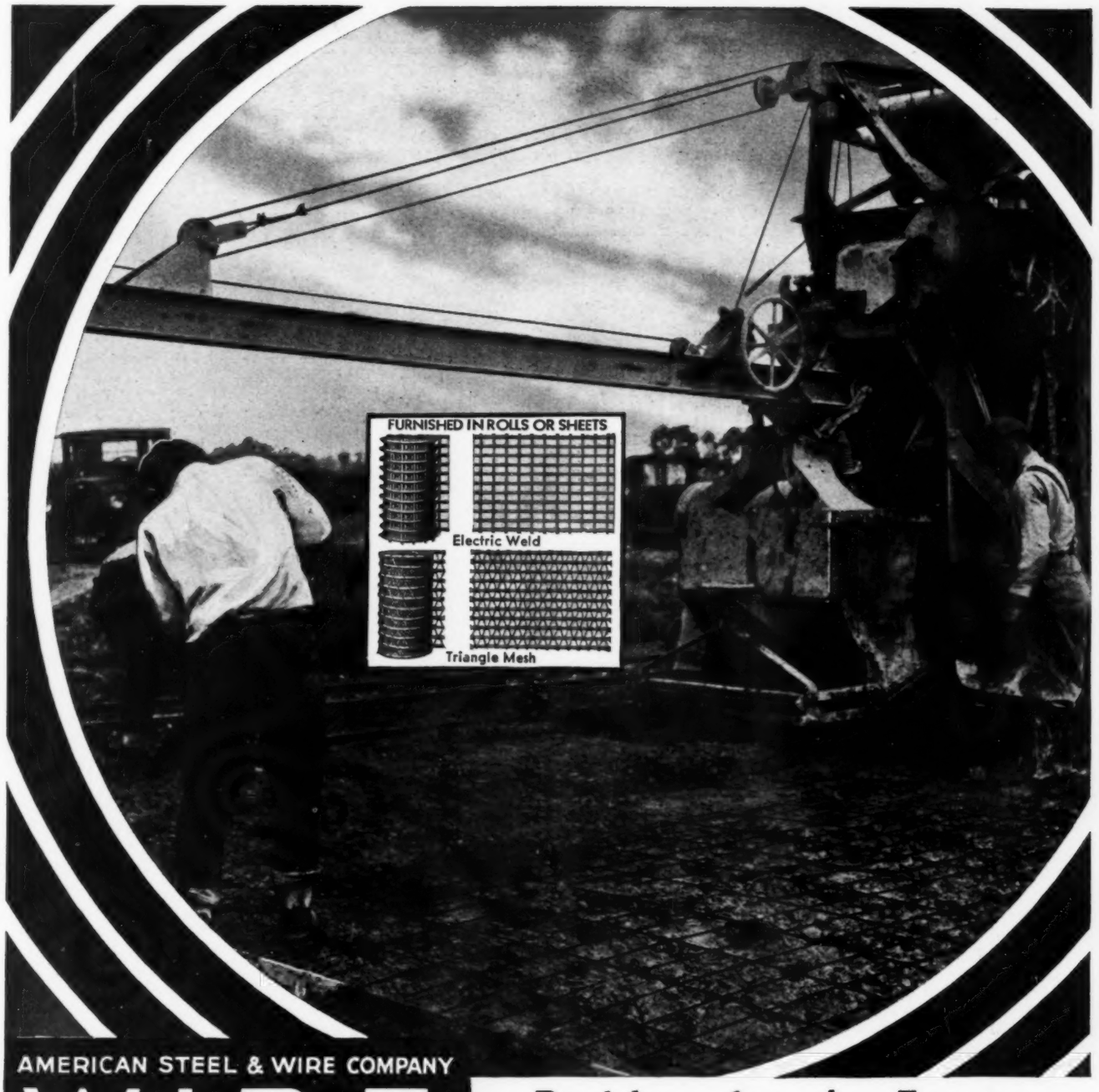
1. Offers the freedom in plant layout and design permitted by this pipe-line system;
2. Permits the use of simple, weather-proof sheds for cement storage, instead of expensive overhead bins;
3. Conveys economically over long distances to permit erection of the plant at the most convenient point for the work to be done;
4. Unloads, conveys, elevates and distributes cement, or recovers from storage as a single operation;
5. Unloads barges as well as box cars;
6. Can be buried underground to avoid interference with roads, yards, etc.
7. Enables contractors to use the same equipment on future jobs.

Write for this new bulletin.

Fuller Company
CATASAUQUA, PENNA., U.S.A.

CEMENT WEIGHING BATCHERS
PNEUMATIC CONVEYORS
COMPRESSORS

STATIONARY and PORTABLE **FULLER-KINYON** **CONVEYING SYSTEMS**



AMERICAN STEEL & WIRE COMPANY

WIRE FABRIC

THE STEEL BACKBONE OF CONCRETE

Building for the Future

Road engineers have found in American Steel & Wire Company Wire Fabric the ideal steel reinforcement for concrete. No other form of reinforcing material possesses the same amount of binding or holding power.

When embedded in a highway, Wire Fabric acts as a steel backbone for the concrete—provides greater tensile strength, and prevents the opening of fine hair cracks which may form in the setting.

Wire Fabric is furnished in road size sheets, according to specifications. Let us send you complete information.

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Yes—We would like you to mention ROADS AND STREETS

HIGHWAY ECONOMICS

THE vehicle owner pays gas and license taxes to get good roads—which should reduce his operating costs by a sum greater than his tax.

The roads should be paid for and maintained at less than the income they produce from the tax—so there may be a surplus of income for new construction.

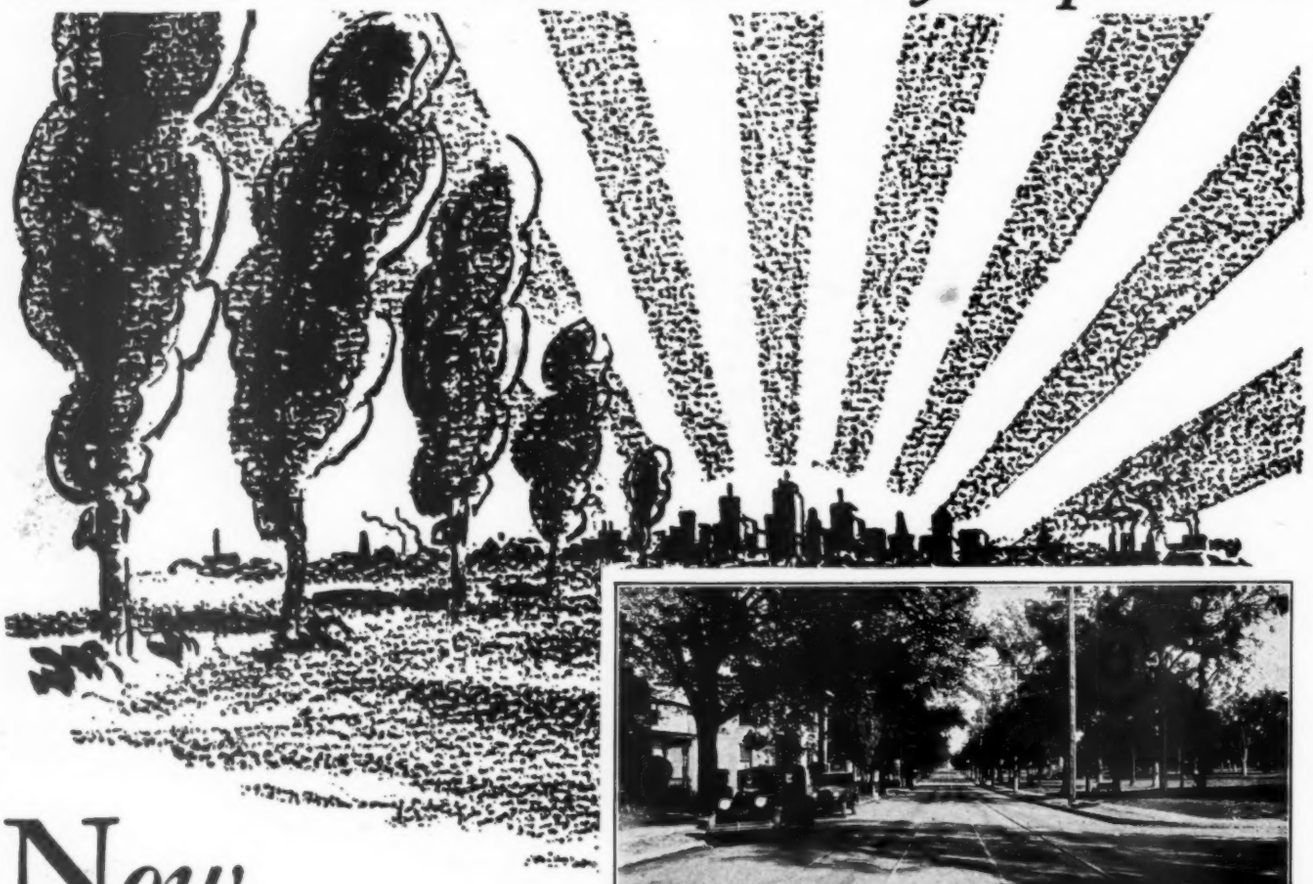
To meet these requirements, American highway engineers have developed the modern **Concrete Road.** Experience and research demonstrate that:

On **Concrete Roads** the cost of transport (vehicle operating costs plus annual charges for the road itself) will be lower than on any other type of surface.

This is true even in comparison with plain gravel surfaces carrying at least 200 vehicles daily, or with bituminous treated (road mix) surfaces carrying at least 450 vehicles daily.

The vehicle owner will enjoy the lowest transportation cost, and the greatest ultimate improved mileage, when his officials invest his taxes in **Concrete Roads.**

BRICK PAVEMENTS—*Always Dependable*



East Ninth Street, Little Rock, Arkansas. Built 1905, repaved in 1927, 3-inch brick, asphalt filler.

Now, more than ever— Long Life and Low Upkeep Are Appreciated

THE wisdom of building brick pavements with their low upkeep costs has been more clearly apparent in the past two years.

In good times or in dull times, brick surfaced roads serve the public well. Even veteran pavements 40-odd years old require little or no money from the treasury and the taxpayers.

Brick is a thrifty, common-sense pavement. Nothing left to chance in constructing it. Completed, it is well-nigh indestructible. What's more, you can be sure expensive bases will be fully protected from weather as well as traffic.

The modern pavement is brick. Recommend or specify it on new construction. Make old, failing pavements as good or *even better than new* by resurfacing with brick.

For further information about brick write National Paving Brick Association, 1245 National Press Bldg., Washington, D. C.

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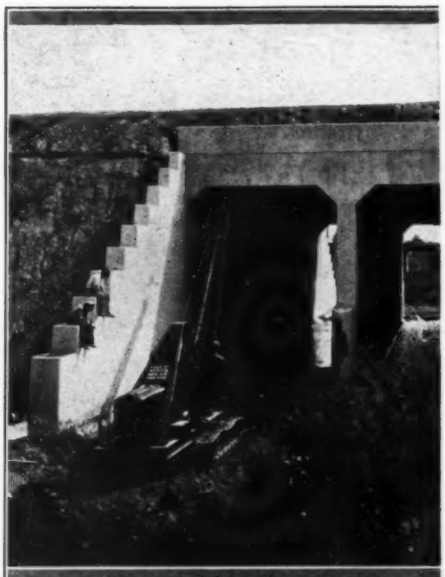
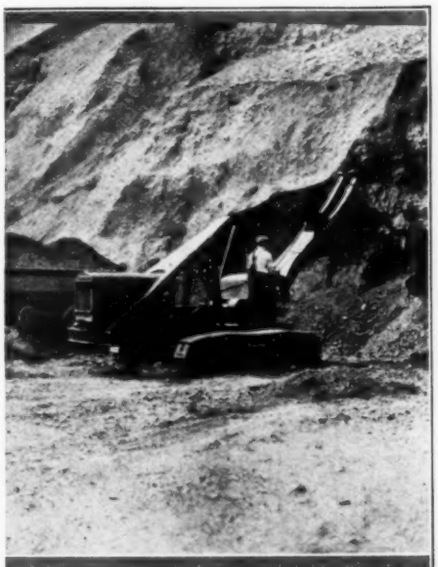
See everything—meet everybody in Detroit on these dates, RR and hotel rates have been cut for it.

A GENERAL UTILITY MACHINE





Quickly Convertible to Shovel, Crane, Dragline or Trench Hoe

Designed with a view to ease of convertibility in the field, the AUSTIN Badger is the ideal general utility machine. Conversion from shovel to dragline or trench hoe is just a matter of minutes and the same is true of mounting and demounting from the special wheel mounts.

The AUSTIN Badger and all of its accessory parts were designed by an "old-timer," one of the originators of the small shovel idea, who has built into it all of the ideas gained in his many years in the field, installing and operating equipment of this kind.

The use of anti-friction bearings throughout, the added dipper capacity, the greater digging reach and dumping height, the low center of gravity and wide crawler treads—these and innumerable other exclusive Badger features are the result of years of field study.

This "built-in knowledge of user requirements" accounts for the fact that more AUSTIN Badgers have been purchased during 1932 than any other shovel in its class.

Write today for complete details on the AUSTIN Badger and names of users in your vicinity so that you can get first-hand data direct from the operator!

"The AUSTIN Badger is the Biggest little shovel on the market."

The Austin-Western Road Machinery Co.
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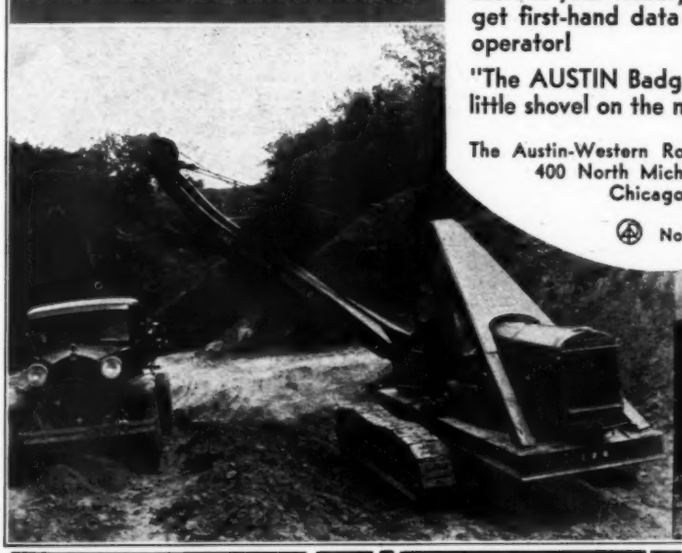
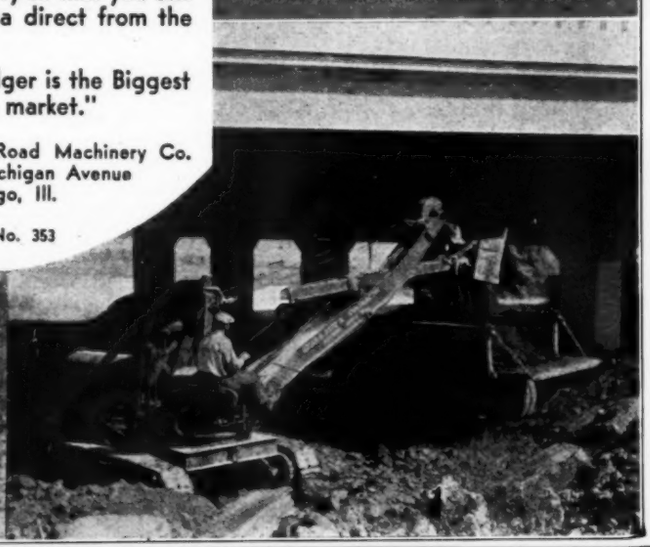
No. 353





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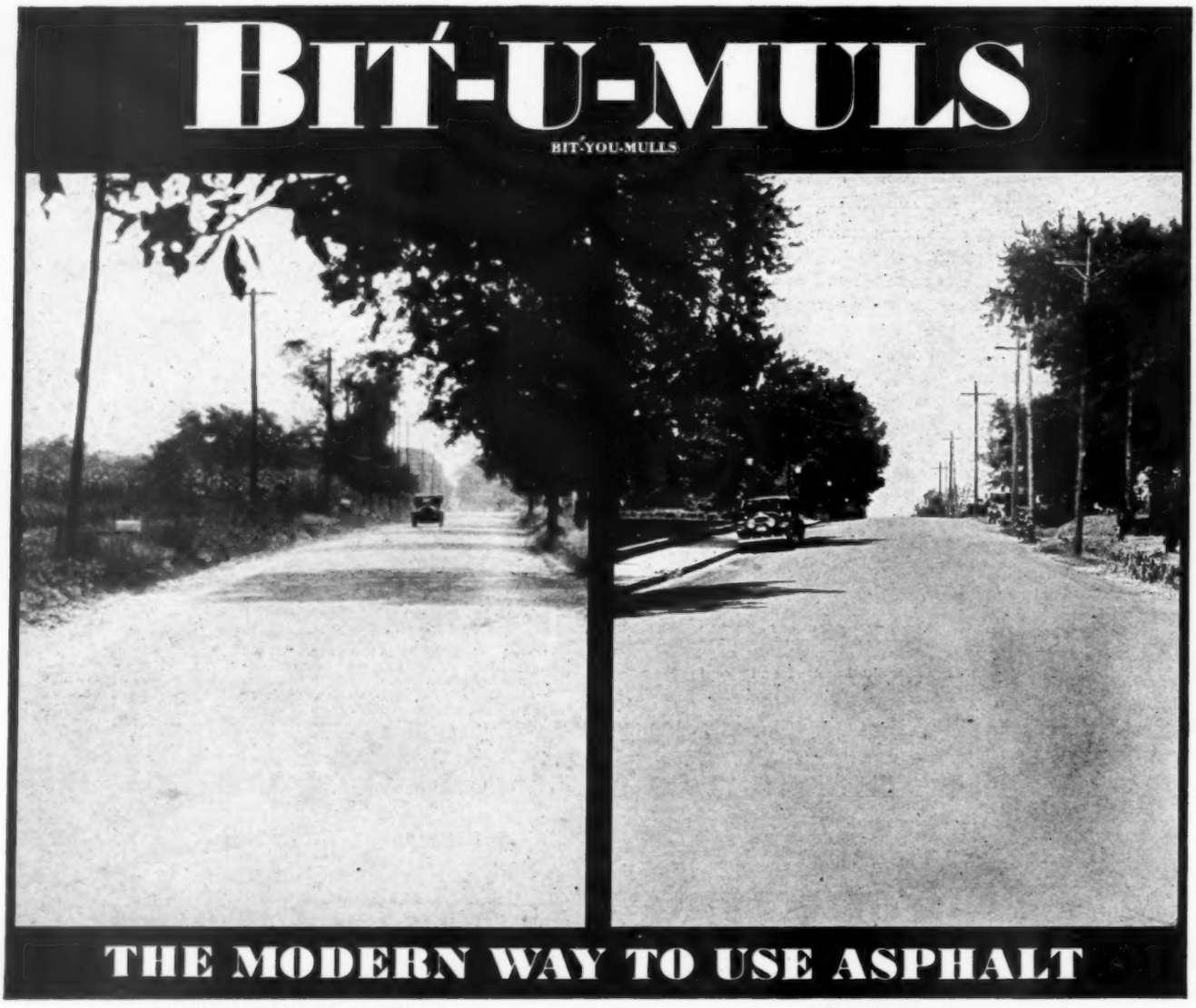

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Jefferson City, Tennessee

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Tarvia
GOOD ROADS at LOW COST

Service Exchange
for Manufacturers and Distributors

Editor's Note.—From time to time we receive letters from distributors wishing to be put in touch with manufacturers of certain lines of equipment, or from manufacturers seeking representatives for their products. Items of this kind will be published and names and addresses furnished interested persons upon request.

New Lines Wanted

Would like to communicate with any manufacturer of Highway Materials or Equipment who wants business and knows what it takes to get it. I am a sales engineer, for the past five years have been traveling the Carolinas, Georgia and Tennessee, selling state and county highway officials. Any concern who has a product used on highway work and needs business, please communicate with me. You know what personal acquaintance means with state and county officials.

Highway construction or sales engineer, last 18 years with large contractors and public works departments, wants connection with firm handling road materials or machinery, preferably for asphalt, tar or road oil construction, either domestic or foreign service. Fluent in Spanish, Portuguese and Hindu. Have thorough knowledge of asphalts, road equipment and highway construction. Well acquainted in South America, Europe and Far East. Salary and commission. References.

Equipment Engineer. Handled equipment repairs, records, and specifications six years for Pennsylvania Highway Department. Carnegie engineering graduate, twelve years' experience including machinery manufacturing. Desires contact other highway departments or large equipment companies.

Mechanical Engineer, conversant and familiar with all classes of construction work and type of machinery, desirous of making a good connection.

Manufacturers' representative wishes to handle equipment in the Municipal, County and General Construction lines, in the Northwest territory.

Sales and service engineer, 35, last twelve years' experience with largest companies, wants connection with firm handling road materials or machinery, preferably for asphalt, tar, or road oil construction, either domestic or foreign service. Fluent in Spanish language, working knowledge French and German. Well acquainted in the Middle West, Rocky Mountain and Pacific Coast territories.

Distributor desirous of securing a line of road and bridge building material, such as steel bars, castings, joints, etc., operating in Northwestern Ohio.

Distributor, well known in outlying towns of Western and Northern New York, handling some well known lines desires to secure additional road machinery and equipment accounts.

Newly organized distributing concern with a personnel of wide selling experience and years of acquaintance in the Philadelphia territory among Road and Building and General Contractors, sand and gravel plants, central mixing concrete and industrial plants, are interested in securing the exclusive representation of several nationally known lines of heavy equipment. This organization is limiting itself to the handling of only a few such lines and can therefore give real representation. References and qualifications exchanged.

Have office and sales facilities for manufacturer of contractors' equipment or supplies who desires reliable representation in Chicago territory. Can arrange for directory listings and devote considerable time calling on contractors and potential prospects. At present handling the sales of one large manufacturer exclusively. Will consider monthly compensation plus commission, or reasonable drawing account against commissions.

Distributor with five years' experience as experimental and testing engineer with large pump manufacturer, wishes to secure a line of centrifugal pumps for the Georgia and Tennessee territory.

Would like to secure distributorship for a line of contractors and road builders equipment. Warehouse facilities available Amply financed.

Distributing organization located in Tennessee desires to handle a complete line of road building equipment.

District sales engineer—formerly with leading manufacturer of excavating machinery for number of years, desires similar position. Familiar with export.

▼

Representatives Wanted

One of the oldest and largest contractors haulage equipment manufacturers is expanding their selling organization and would like to correspond with distributors in this type of equipment throughout the country and abroad who are desirous of taking on a line that contains new features and has always had a reputation for standing up to their job, a line that will be productive of increased profits and satisfaction. It will require very little capital to handle this account, but the distributor must be financially responsible. He will be backed by the proper advertising and mailing campaigns.

Manufacturer of a proven highway guard desires live representatives in strategic locations outside of the Mississippi and tributaries valley. Representatives should have acquaintance with municipal, county and state highway officials, and engineers and contractors in the road building industry. Complete promotional backing by million dollar company for local organization or individual who can produce.

Man with at least $10,000 working capital and good credit rating can obtain state or district distributorship for a leading manufacturer of construction equipment.

Manufacturer is looking for representatives in metropolitan area of New York City to handle line of tar and asphalt kettles, tool boxes and pressure distributors.

Manufacturer of equipment for trucks has a number of excellent exclusive territories open throughout the country particularly in central and southern states.

Manufacturer of armored runways for wooden bridge floors seeking distribution points in West Central States including Wyoming, Colorado, Nevada, Montana, Arizona, Idaho, Utah, New Mexico, North and South Dakota, Nebraska and Kansas.

Manufacturers of road rollers with various attachments would like to make connection with aggressive distributors in Tennessee, northern Mississippi, Alabama, Arkansas, Oklahoma and southern Texas.

Manufacturer of crushing and screening plants wants a representative in Manila, Philippine Islands.

Manufacturer of scarifier maintainer wishes to have his product manufactured and sold in other states outside of Minnesota. Agents wanted in every county in Minnesota.

Local dealer or salesman wanted—who is personally acquainted with his city or town officials. Can earn liberal commissions selling street signs. Used in over 350 leading cities.

Textile manufacturer wishes sales representative to handle complete line of tarpaulins. Distributors, now handling road building equipment and other contractors' supplies, especially desired.

Manufacturers of ditching and trenching machines, to facilitate the laying of pipe lines, have liberal proposition to offer dealers.

Manufacturer of metal traffic lane markers for pavements, has a number of desirable territories open. Write for their proposition.

Manufacturer of patented highway and zone marking machines desires sales representatives who are acquainted with highway officials in their own state.

Manufacturer of grader wants dealers in west and east central states.

Manufacturer of a new tractor dump wagon has a number of desirable territories open. Full cooperation extended to distributors.

Manufacturer of asphalt ingredient adaptable for use in the road or industrial field, is seeking representatives for desirable territory in various parts of the country.

Territory open in several states for representatives to handle grade-rippers, mechanical plows.

Manufacturer of steel dump bodies and oil heaters seeking distribution points in west central and southern states, including Missouri, Kansas, Iowa, Nebraska, Colorado, Kentucky, Tennessee, Mississippi, Arkansas, Louisiana and western half of Illinois.

JOIN THE

American Society of Engineering-Contractors

This call for applications for membership in the proposed American Society of Engineering-Contractors is issued by Halbert P. Gillette, editor of Engineering and Contracting. On the first editorial page of Engineering and Contracting you will find 10 planks of its editorial platform, which should meet the approval of every public works contractor.

It is proposed that membership pins shall be worn by members and associate members.

It is proposed that the annual dues of this society shall be $5, and that employes of contractors, construction engineers and manufacturers and distributors of construction equipment and materials may become associate members.

The publisher of Engineering and Contracting will donate space in its editorial pages for the publication of the proceedings of the society. This will permit the use of the dues to convince the editors of newspapers, public officials, legislators and others that the contract method of public works construction is cheaper than the day-labor method, and that the other policies sponsored by this society are economically sound.

In addition to matters of public concern, the members of the society should exchange ideas on the keeping of cost records, the economic efficiency of machines, the management of men, etc.

Please sign this blank, and also express your ideas as to ways and means of bringing about the rapid development of the society.

HALBERT P. GILLETTE,
400 West Madison St.,
Chicago, Ill.

I wish to become a charter member of the American Society of Engineering Contractors, provided the dues and conditions of membership shall be satisfactory to me.

Name (print it).....

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R-12-32

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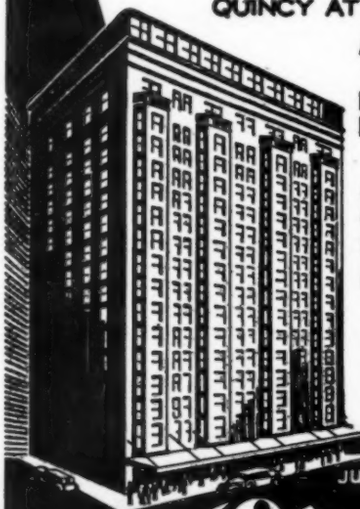

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